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The proceedings of a conference on television in postgraduate and continuing medical education for general practitioners are presented in this three-part report. Part One contains papers on medical broadcast television which examine the problems of informing the isolated doctor and groups of doctors of new developments; the usefulness and structure of a semantic differential method of program assessment which is completed by doctors; stages in the evolution of an instructional program; the value, methods, and costs of an integrated approach; general features to consider when creating an instructional program; problems involved in showing medical treatments on broadcast television; the problems of communication between specialists and the target audience--general practitioners; and general limitations of medical educational television (such as cost, air time, and publicity). In Part Two papers on recorded television explore the advantages of using Electronic Video Recording (EVR), the technical factors to consider in recording for television, and steps in the process of developing viewer involvement. Part Three contains papers on closed circuit television (CCTV) which detail the uses, costs, and relative merits of single and double camera CCTV, and describe what can be expected of manufacturers and suppliers of television equipment. (SM)

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"To consider the advantages and disadvantages and to discuss the potential development of broadcast and closed-circuit television in postgraduate and continuing education."

Television in Postgraduate and Continuing Medical Education

4th and 5th October, 1968
B.M.A. House, Tavistock Square, London, WC1.

Primarily for Tutors, Advisers and Deans of Postgraduate Medicine

Organised jointly by The Television Section, Association for the Study of Medical Education and The Department of Audio Visual Communication, British Medical Association

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EM007 393

PROGRAMME OF CONFERENCE

Conference Chairman **Dr. C. M. Fletcher**

Friday 4th October

9.00 a.m.

Registration

9.30 a.m.

Conference opened by– The Rt. Hon. The Lord Cohen of Birkenhead, M.D., D.Sc., LL.D., F.R.C.P.

First Session Chairman : Dr. G. Shaw

10.00 a.m.

A brief review of Broadcast Medical Programmes, introduced by their Producers
Mr. R. McPherson–Scottish Television
Mr. J. McCloy–British Broadcasting Corporation
Mr. J. Parker–Tyne Tees Television

10.30 a.m.

Comparison presentation of a programme by television receiver and large screen film projection

Discussion

10.45 a.m. Coffee

Second Session Chairman : Dr. R. Ll. Meyrick

11.15 a.m.

The Advantages and Disadvantages of :
1. Viewing at Home : Dr. M. Essex-Lopresti
2. Viewing as a Group : Dr. H. Wykeham Balme

Discussion

12 noon

The Strategy of Programming
1. The Concept of the 'One programme-a-week term' : Dr. G. Shaw
2. Integration of Broadcasts with other Methods of Learning : Dr. G. R. O. Walpole

Discussion

1.00 p.m. Lunch

Third Session Chairman : Dr. T. A. Quilliam

2.15 p.m.

Opportunities and Limitations of Broadcast Programmes :
Mr. J. McCloy
Mr. R. McPherson
Mr. J. Parker

2.50 p.m.

The Tutors' Viewpoint
Discussion and Questions from the floor to be answered by a Panel of Speakers

3.20 p.m.

First Introduction of E.V.R.
(for viewing 'films' on home television receivers) : Mr. J. Wren-Lewis

Discussion

3.40 p.m.

A Guide to Video Tape Recorders : Mr. B. R. Webster

Discussion

4.15 p.m. Tea

Fourth Session Chairman : Mr. R. MacLean

4.40 p.m.

Demonstration and Discussion of Video Tapes prepared under University and Hospital conditions

Saturday 5th October

Fifth Session Chairman : Dr. P. Hansell

9.45 a.m.

Your own Television Equipment–what you can expect
1. Using One Camera : Mr. C. J. Duncan
2. Using Two Cameras : Mr. R. MacLean

Discussion

10.45 a.m. Coffee

Final Session Chairman : Dr. C. M. Fletcher

11.15 a.m.

What the Manufacturer needs to know, and what Help he can offer :
Mr. M. W. Cross
Mr. W. E. Budge
Mr. M. Macdonald Shepherd

Discussion

11.55 a.m.

Demonstration of a Recording Being Made

Discussion

1 p.m.

Conference ends

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PREFACE

Television has for some years been widely discussed as a suitable medium for post-graduate and continuing medical education. Its uses, however, have hitherto been limited, though amongst others, closed circuit television has enabled clinical demonstrations and surgical operations to be shown to large audiences, and programmes have been broadcast in such series as the B.B.C.'s 'Medicine Today', and by Scottish and Tyne-Tees Television so that the doctor may be reached in his home.

But television is clearly not the answer to all problems of medical education. It is but one instrument of instruction and its general adoption depends on the answers to many crucial questions. For example:-
What specific educational aims and needs are best served by television? What does an assessment of current television programmes reveal as to their value in medical education? In these days of financial stringency in education, does the cost-effectiveness of television - expensive in equipment and time - justify its use? Which techniques of presentation are most suitable in divers circumstances? What are the relative preferences expressed for television, as compared with lectures, clinical demonstrations?

The Conference, whose proceedings are recorded in this volume, sought to answer many of these questions and to provide the opportunity for seeing in action many of the most up-to-date instruments and techniques in this field.

I can confidently recommend this volume as presenting a critical appraisal of the current status and future potential of television in medical education, and I would like to record the gratitude of the joint organisers - The Association for the Study of Medical Education and The Department of Audio Visual Communication of the British Medical Association -to all those who contributed to the success of this Conference.

COHEN OF BIRKENHEAD,
President, ASME.

Introduction

The accelerating growth of organized postgraduate education has created a need for more information on methods of implementing educational programmes. Television is perhaps the most costly and intricate device yet evolved for the transmission of knowledge. It is not likely to justify its somewhat glamorous promise, unless the tutor comes to recognize both its unique properties and its limitations.

This conference was, therefore, planned to examine some of the various factors which must be considered if we are to make the best possible use of television towards solving the considerable problems which face us in postgraduate education.

The first part of the conference concerned itself with broadcast television, an attempt to reach individual doctors in their own homes and widely scattered groups of doctors in their local hospital. Both the planning of programmes and the effect at the receiving end were discussed.

Unsuitable timing of broadcasts, variable interest of contents and the inability to interrupt a transmission for discussion or more direct teaching were some of the difficulties isolated by the tutors. Some of these handicaps might be over-come to some extent through recording the broadcasts for replay at a time and place determined by local needs. These considerations led to more detailed discussion of methods of recording and playback.

It would at present be illegal to use broadcast television as means of disseminating information, during the "dead" hours of the night, for automatic recording and play-back in the user's own time. However, individually produced video tapes may be of even more direct value. A number of video tapes were shown to illustrate the wide application of this medium, particularly where active participation by the individual in a group can be encouraged. It may here be possible to enlarge the scope of learning to include observation, discrimination, deduction and decision making, as well as the assimilation of facts.

If a postgraduate centre should decide to use a video tape recorder, the further acquisition of equipment for recording would greatly enlarge its facilities. It was, therefore, logical to conclude the conference with a practical discussion of the relative versatility and cost of a single television camera and a two camera television chain. The grand finale of the meeting was the demonstration of an actual recording being made. This illustrated the simplicity of equipment and techniques employed to achieve a useful record for postgraduate teaching.

The Editors

ADVANTAGES AND DISADVANTAGES OF VIEWING AT HOME

by

M. Essex-Lopresti

Why should the Clinical Tutor be concerned with the lone viewer?

If Clinical Tutors are responsible for the continuing medical education of doctors in their areas, they must also be concerned with those who may not take advantage of the facilities provided at the post-graduate medical centres. Many of them work in professional, if not in geographical isolation. For these doctors medical television programmes, which they can receive at home, are perhaps the best form of medical education easily available to them. This is recognised by the television producers who design their broadcasts for the lone viewer rather than for group audiences, and tutors should take advantage of this service and consider how best they may harness it to make it more effective.

What are the advantages and disadvantages of viewing alone?

Programmes will only be switched on if they are genuinely interesting; unlike group viewing, home viewing does not fulfil the provision of Section 48 of the Act. Reasons for watching might include a desire for information which might modify one's management of a case; a need for up-to-date knowledge on hospital treatments, so that patients referred may be advised and reassured on what to expect, and also to discover what conditions may now be amenable to hospital treatment; and the satisfaction of a general interest in recent medical advances.

One difficulty is to remember to watch a programme which is transmitted late at night once a month. In this respect the series of weekly programmes, heralded by a booklet giving details and programme notes, by Scottish Television and Tyne-Tees Television is an advantage. The lack of publicity for "Medicine Today" on BBC-TV is a serious handicap. The only publication associated with the BBC transmissions appears in the *British Medical Journal after the first of the two transmissions of each programme. The times of transmission are the most unsatisfactory and yet, despite the fact that the mind is less receptive after 11.30 p.m., investigations have shown that approximately three-quarters of those who watch do so at night rather than at lunch time. The absence of any opportunity to discuss a programme is considered by some to be a major disadvantage, as there is no possibility of correcting a misunderstanding or of encouragement to seek clarification of a point. In recent BBC-TV programmes it has been the custom to have in the studio a general practitioner who can question the experts during the programme, and this usually seems to clear up points which might otherwise remain in doubt. Tutors should ask if this is sufficient and whether it is a suitable substitute for discussion.

How can tutors help to overcome the disadvantages?

There are three ways of helping doctors who view at home. If programme cards or other circulars are issued from the post-graduate medical centre, dates and times and, if possible, subjects of programmes can be included. This calls for

* These articles are no longer included in this journal.

more advanced information than is a present available from the BBC on titles and dates. In addition notes on the subject, such as those issued in association with the "Postgraduate Medicine" series in Scotland and the North, could be sent by Clinical Tutors to the doctors in their areas in advance of each programme. Tutors might also arrange a display of relevant material at their centres, so that doctors, who are unable to attend formal sessions, can call in to see a selection of books, x-ray films, ECG traces, photographs, pathological specimens and so on, of cases similar to those dealt with in a television programme. It might well be useful to devote a meeting or part of a meeting to a condition which was the subject of a recent programme, or a ward round could be arranged to show suitable cases to illustrate that subject.

"GROUP VIEWING OF MEDICAL TELEVISION BROADCASTS -
AN EXPERIENCE AT WHIPPS CROSS HOSPITAL"

by

H. Wykeham Balme

At Whipps Cross Hospital doctors have been viewing "Medicine Today" as a group since January 1967. Ciba Laboratories Ltd. generously gave a television set for the purpose. Reactions to the programme have been varied. The main difficulty has been that television has to compete with the activities of the Forest Medical Society.

Doctors watched the programmes which became part of the regular activities of the Society, in the Lecture Room of the Medical Education Centre, where the meetings were chaired by a local Consultant with special knowledge of the subject under discussion.

The Forest Medical Society has about 300 members, and for the last few months a rough tally as been taken of their attendances at the various activities of the Society. Excluding those attendances which are necessarily restricted to a definite number of participants, such as the M.R.C.P. Courses, the most popular of all meetings are the Tuesday lunch time Clinical Meetings. These take place at 1 o'clock, and are commonly attended by about 60 doctors, three quarters of whom are general practitioners. Formal lectures, in the evenings, are less popular when approximately 40 doctors attend, but this is naturally dependent on the subject matter and the lecturer. The third most popular item is the Child Psychiatry Conference drawing perhaps 30 doctors.

It is after this in popularity that the B.B.C. Television Series comes with a usual attendance of about 20 or so. Least popular of the monthly activities are medical films. The films, although very carefully selected from many sources, are so unpopular that attendances only rarely reach into double figures, and 4 is a a more usual figure. The films are undeservedly unpopular, the information they give is often very good indeed. Compared with films, television has the disadvantages that the audience has to look at a little box, the television set, and listen to unnatural voices.

Criticism of the programmes is levelled at the medium itself - a natural distrust of canned instruction, the inability of the audience to challenge the speakers or ask them to amplify what has been said. This inevitable impersonal nature makes it a second-rate show, compared with live instruction.

Over the last year the various chairmen have also expressed disappointment. They found these programmes difficult to discuss afterwards with the audience, although many chairmen admitted that the information given in the programmes and their mode of presentation had been good. By the cynic it might be said that it was only the Registrar who really appreciated these programmes, as he was relieved of the necessity to work up and present clinical cases.

One suggestion for the future. It would help greatly if a much more detailed account of the programme could be circulated well in advance. Perhaps the evening programme could be transmitted before the midday screening.

GROUP VIEWING OF "MEDICINE TODAY" BROADCASTS

A SMALL SCALE TRIAL INTO SUBJECTIVE RESPONSES

by

R. Ll. Meyrick

The purpose of this small-scale and unsophisticated trial was to test three major matters.

Firstly, the response of General Practitioners and other doctors to being given a form to fill in following a television broadcast.

Secondly, to test the value of a semantic differential method to elicit subjective responses to the television programmes.

Thirdly, to see if some means of testing by multiple choice questions could be used to assess knowledge gain immediately following the broadcast.

It was known that a number of groups of doctors meet in hospitals and elsewhere to view the lunchtime transmission on B. B. C. 2 of the Medicine Today programmes. It was also known that the B. B. C. proposed to broadcast three programmes, linked in nature, concerning the diagnosis, management and treatment of wheezing in young children. It was therefore decided to send, without warning, a number of forms to Clinical Tutors and other organisers in ten areas where groups were known to meet, asking them for their co-operation and comments with regard to testing the three programmes.

We should record, with appreciation the co-operation offered and the response received from the Clinical Tutors and others involved.

In the event, 270 forms were sent in each of the three months, but due in some cases to technical failures of reception and in others to local difficulties, the same groups did not respond on all three occasions. As the programmes were originally designed and transmitted for viewing by General Practitioners, the response of Hospital Staff and Public Health Staff, although included in the returns, are not analysed on the graphs or in the response to multiple choice questions.

The first programme - 104 replies were obtained from General Practitioners and 38 from Hospital Staff, making a total of 142. Four forms were not included as the information carried on them was inadequate for analysis.

The second programme - 95 General Practitioners replied and 32 Hospital Staff, making a total of 127, and 2 forms were rejected.

The third programme - 107 General Practitioners replies and 28 Hospital Staff, giving a total of 135, and 3 forms were rejected.

The graphs, therefore, are relatively comparable and indicate a total with a differential of only nine in the second programme and three in the third programme. If it can be assumed that the nine General Practitioners who failed to reply in the second programme would, in fact, have replied in accordance with

the 95 who did respond, little difference would be noted.

COMMENTS

It is clear, and, indeed, in the third questionnaire it is maintained, that the distribution and answering of forms of this nature is in no way rejected by doctors.

The sensitivity of the semantic differential method of testing seemed to provide the most valuable assessment of subjective response so far obtained for such television programmes. Various methods of scoring are available, and it may be reasonable to test a different method of scoring in the future. However, very few doctors answering the questionnaire apparently had much difficulty in using the present system.

The use of multiple choice questions for testing factual gain in knowledge is well established. In the test form for Programme 1, the multiple choice questionnaire worked reasonably well, and it might be open to local areas to re-test at some time in the future and compare the results. In the second programme, however, the multiple choice system was badly thought out and unfortunately produced virtually useless results. It was, therefore, abandoned in the third programme in favour of factual questions (regarding the three programmes), to the response of the viewing doctors to these questions, and to the fact of being questioned. This information is of considerable value.

It is interesting to note that very few doctors seem to have had any difficulty in filling in the semantic differential section, but considerably larger numbers failed to reply to the multiple choice questions. For the first programme only 72 General Practitioners answered the multiple choice questions as against 104 who filled in the semantic differential. In the second programme only 84 replied to the multiple choice questions, against 95 who returned the semantic differential questions.

It is suggested that the semantic differential method of assessment should be extended and used regularly for obtaining information on subjective responses of doctors viewing in groups.

It is also suggested that a small trial along similar lines should be undertaken with doctors viewing under individual circumstances at home.

FIRST PROGRAMME - COPY OF QUESTIONNAIRE SENT

ASSOCIATION FOR THE STUDY OF MEDICAL EDUCATION

Please circle whether G. P., Consultant, Hospital Staff, Public Health.

IN PART A please place a cross in the appropriate square to record the degree to which the words at either extreme express your feelings about the programme.

INTERESTING	5	4	3	2	1	2	3	4	5	DULL
INFORMATIVE	5	4	3	2	1	2	3	4	5	UNINFORMATIVE
CONTROVERSIAL	5	4	3	2	1	2	3	4	5	FACTUAL
COMPLICATED	5	4	3	2	1	2	3	4	5	SIMPLE
USEFUL TO YOU	5	4	3	2	1	2	3	4	5	USELESS TO YOU

IN PART B please answer the questions in turn, indicating in the appropriate square the answer you believe to be correct as a result of watching the programme.

1. Do the bronchi of an asthmatic

   constrict more readily ☐
   constrict less readily ☐
   dilate more readily ☐
   dilate less readily ☐

2. In severe asthma is the fixed component due to

   bronchial constriction ☐
   mucosal swelling ☐
   fibrosis ☐

3. Can respiratory tests distinguish between simple bronchitis and bronchitis with bronchiectasis?

   Yes ☐
   No ☐

4. Has this programme (1) altered your view of asthma

   Yes ☐
   No ☐

   (2) influenced you to seek more information

   Yes ☐
   No ☐

FIRST PROGRAMME - ANALYSIS OF RESPONSE

Rating 1-5 :-	1	2	3	4	5
Interesting	22	20	33	12	5
Dull	1	3	3	4	1
Informative	26	26	33	15	1
Uninformative	0	1	3	1	0
Controversial	10	11	13	16	14
Factual	7	10	15	3	6
Complicated	11	11	15	18	16
Simple	3	8	9	7	7
Useful	12	17	33	21	5
Useless	3	2	5	1	5

104 replies from G. P's

38 replies from Hospital Staff

142 replies out of a total of 270 sent out

4 replies were useless

G. P. 's of 72 replies analysed:

Q. 1. 32 Correct 44%

2. 63 Correct 88%

3. 39 Correct 46%

4. i. 19 Correct 22%

4. ii. 60 Correct 87%

Hospital Staff : 26 replies analysed

Q. 1. 10 Correct 36%

2. 19 Correct 71%

3. 11 Correct 37%

4. i. 8 Correct 33%

4. ii. 19 Correct 71%

SECOND PROGRAMME - COPY OF QUESTIONNAIRE

ASSOCIATION FOR THE STUDY OF MEDICAL EDUCATION

Please circle whether G. P., Consultant, Hospital Staff, Public Health.

IN PART A please place a cross in the appropriate square to record the degree to which the words at either extreme express your feelings about the programme.

INTERESTING	5	4	3	2	1	2	3	4	5	DULL
INFORMATIVE	5	4	3	2	1	2	3	4	5	UNINFORMATIVE
CONTROVERSIAL	5	4	3	2	1	2	3	4	5	FACTUAL
COMPLICATED	5	4	3	2	1	2	3	4	5	SIMPLE
USEFUL TO YOU	5	4	3	2	1	2	3	4	5	USELESS TO YOU

IN PART B please answer the questions in turn, indicating in the appropriate square the answer you believe to be correct as a result of watching the programme.

1. Do all asthmatic children have

   underlying emotional tensions ☐

   excessive lability of the bronchus ☐

2. Are the more severe forms of asthma more likely to have an

   organic basis ☐

   psychogenic basis ☐

3. Are the milder forms of asthma more likely to have an

   organic basis ☐

   psychogenic basis ☐

4. In successfully treated asthma does the physiological liability

   improve ☐

   remain unchanged ☐

   deteriorate ☐

SECOND PROGRAMME - ANALYSIS OF RESPONSE

Rating 1-5:-	1	2	3	4	5
Interesting	0	10	22	25	30
Dull	1	1	0	0	6
Informative	7	15	28	15	17
Uninformative	0	0	2	2	4
Controversial	5	4	27	13	18
Factual	4	5	9	4	0
Complicated	7	14	11	6	7
Simple	6	4	11	8	15
Useful	10	12	15	15	17
Useless	10	5	3	4	2

95 replies from G. P. 's

32 replies from Hospital Staff

127 replies out of a total of 270 sent out

2 replies were useless

G. P. 's of 84 replies analysed:

Q. 1. 74 Correct 89%

2. 12 Correct 15%

3. 10 Correct 12%

4. 34 Correct 45%

Hospital Staff 32 replies analysed

Q. 1. 11 Correct

2. 4 Correct

3. 6 Correct

4. 4 Correct

THIRD PROGRAMME - COPY OF QUESTIONNAIRE

ASSOCIATION FOR THE STUDY OF MEDICAL EDUCATION

Please circle whether G. P., Consultant, Hospital Staff, Public Heath.

IN PART A please place cross in the appropriate square to record the degree to which the words at either extreme express your feelings about the programme.

INTERESTING	5	4	3	2	1	2	3	4	5	DULL
INFORMATIVE	5	4	3	2	1	2	3	4	5	UNINFORMATIVE
CONTROVERSIAL	5	4	3	2	1	2	3	4	5	FACTUAL
COMPLICATED	5	4	3	2	1	2	3	4	5	SIMPLE
USEFUL TO YOU	5	4	3	2	1	2	3	4	5	USELESS TO YOU

IN PART B please answer the questions in turn, indicating in the appropriate square the answer you believe to be correct as a result of watching the programme.

---

1. Which of the three programmes on "WHEEZY CHILDREN" have you seen?

   1. ☐
   2. ☐
   3. ☐

2. Have any of the programmes

   a) helped you — Yes ☐ — No ☐

   if so, which — 1. ☐ 2. ☐ 3. ☐

   b) confused you — Yes ☐ — No ☐

   if so, which — 1. ☐ 2. ☐ 3. ☐

3. Will you continue to watch "MEDICINE TODAY"? Yes ☐ No ☐

4. Would you be willing to continue to assist in testing these programmes by answering multiple choice questions during the next session?

   Yes

   No

THIRD PROGRAMME - ANALYSIS OF RESPONSE

Rating 1-5:-	1	2	3	4	5
Interesting	4	16	22	30	30
Dull	0	0	5	0	0
Informative	4	16	30	31	15
Uninformative	0	4	5	0	0
Controversial	9	22	28	6	7
Factual	9	4	10	9	2
Complicated	22	5	16	6	2
Simple	16	8	12	12	8
Useful	8	16	31	21	22
Useless	0	2	5	2	0

107 replies from G. P. 's

28 replies from Hospital Staff

135 replies out of a total of 250 sent out

3 replies were useless

G. P. 's: of 72 replies analysed 48 had seen Programme 1

43 " " " 2

72 " " " 3

of 62 who said the series had helped them ...

28 said Programme 1 helped

27 " " 2 "

57 " " 3 "

of 26 who said the series confused them ...

12 said Programme 1 confused

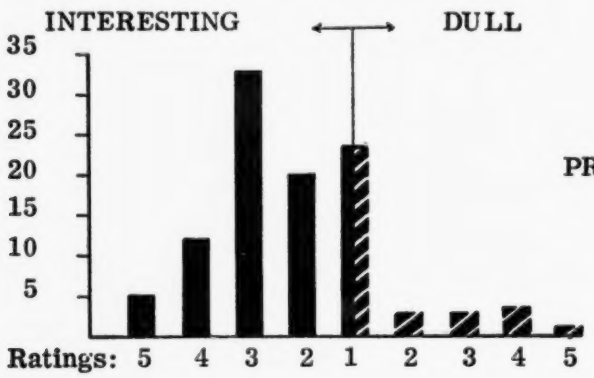
13 " " 2 "

12 " " 3 "

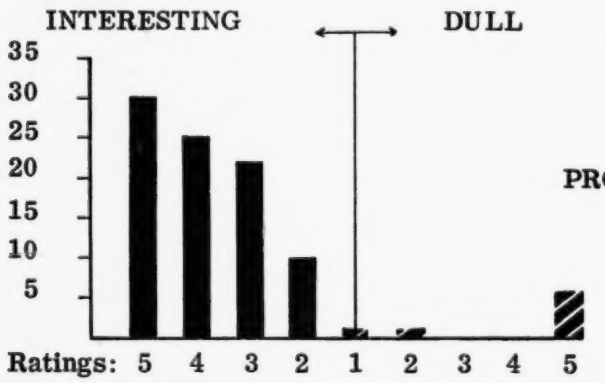
71 of 72 said they would continue to watch Medicine Today

70 of 72 agreed to answer multiple choice questions

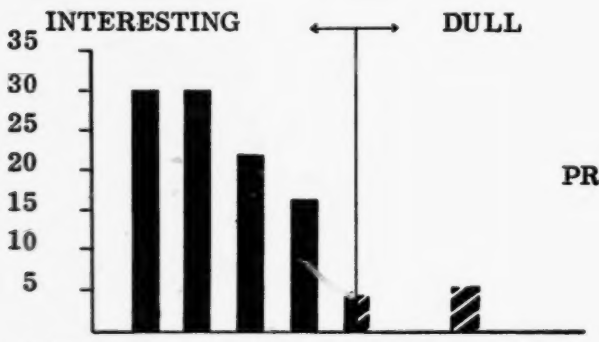
The following histograms were derived from the semantic differential tests set after each of the three television programmes.



PROGRAMME I.



PROGRAMME II.



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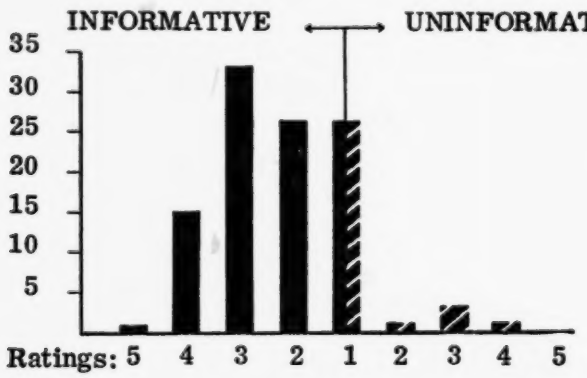
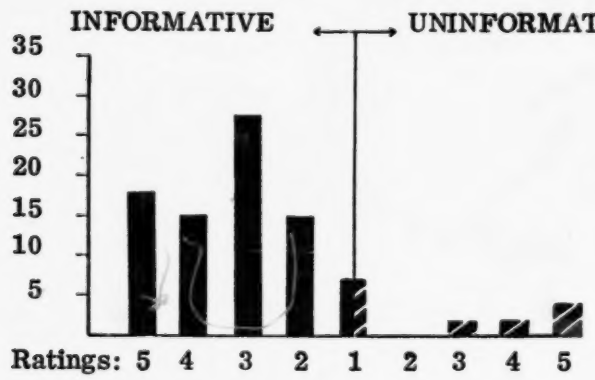
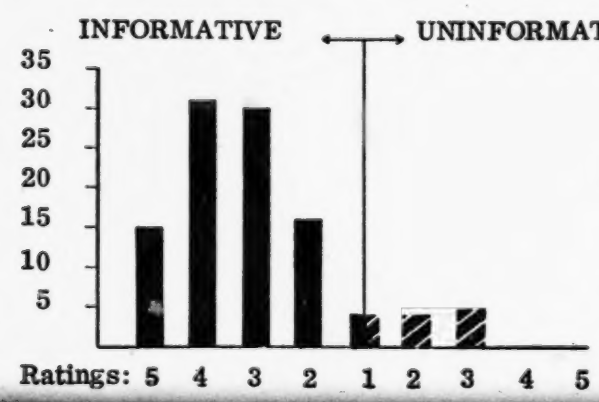


PROGRAMME I.



PROGRAMME II.



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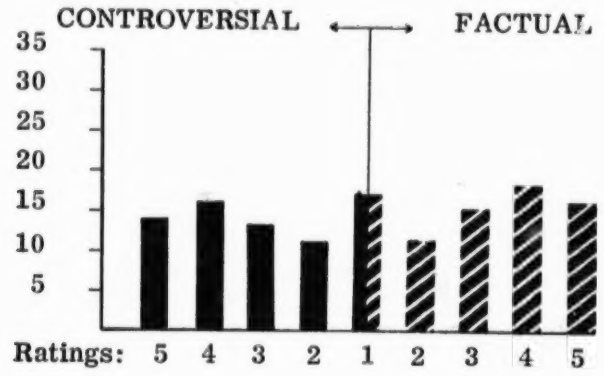

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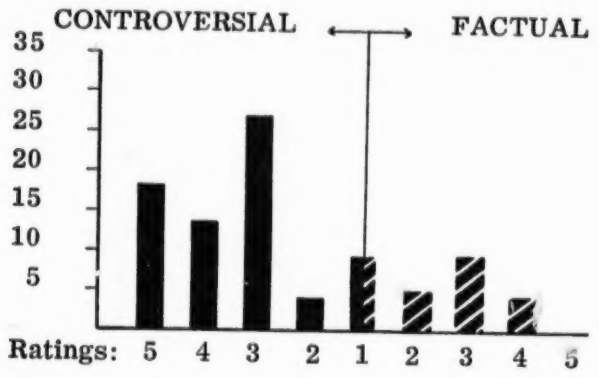

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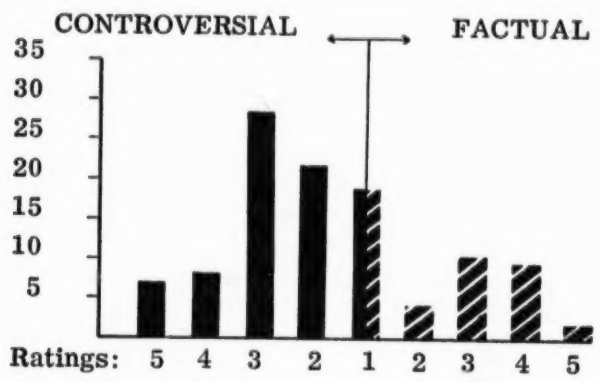

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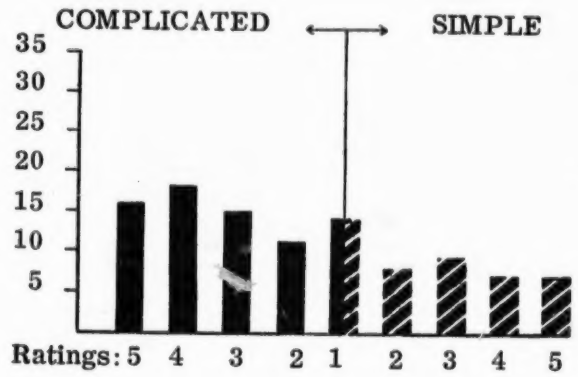

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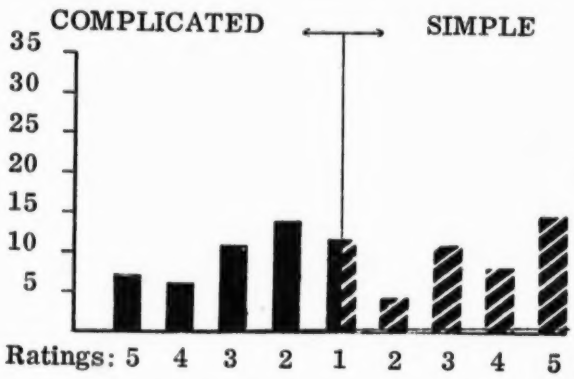

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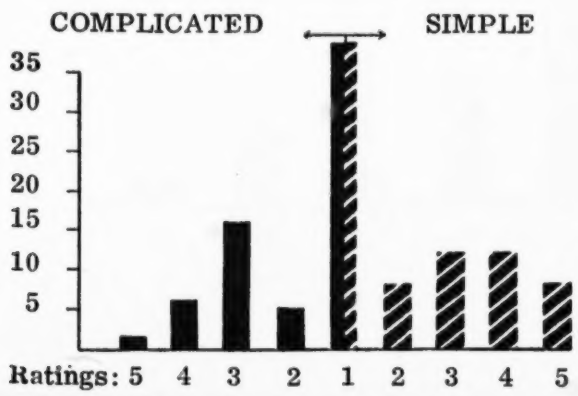

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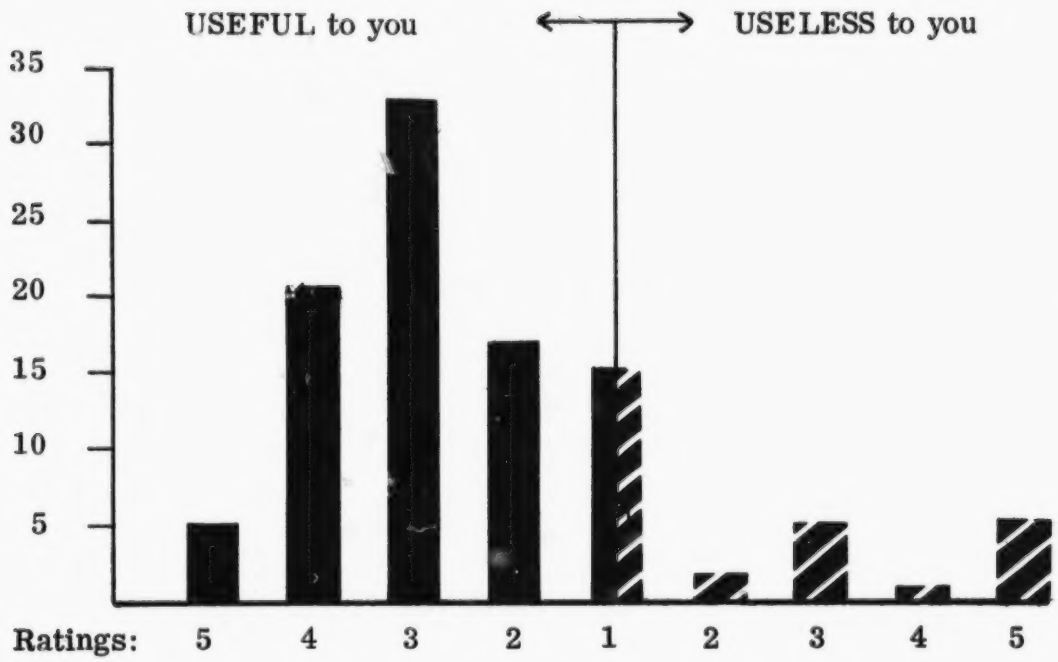

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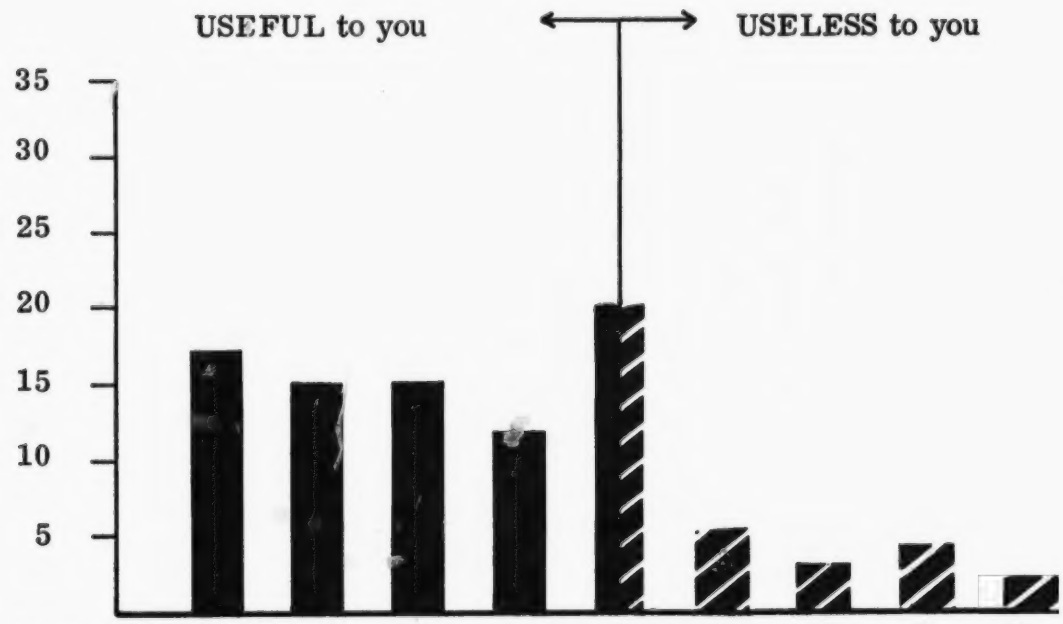

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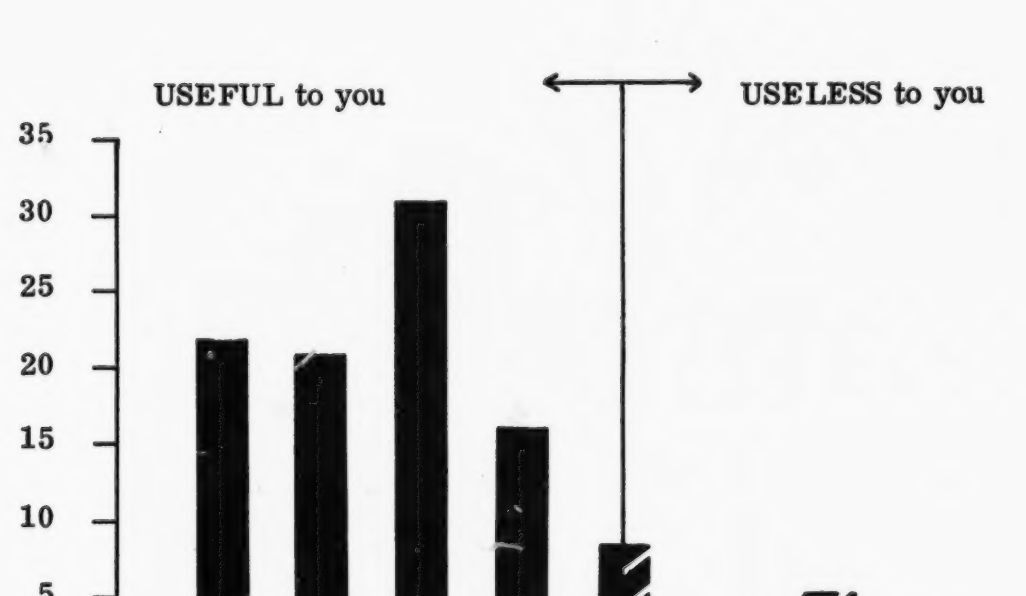


PROGRAMME III.

A STRATEGY OF PROGRAMMING

by

G.B. Shaw

The facts hardly live up to the high sounding title. At the start, in 1963, all the factors which be-devil careful planning in this field were operative at full strength. Lack of time and experience, absence of feed-back, dependence on willing but not always suitable or malleable personnel, adherence to outmoded methods of teaching and, always, the pressure of next month's programme only four weeks distant. All these difficulties made a coherent series of titles impossible to achieve. Indeed, the project was so entangled in the technique of television that inadequate consideration was spared for the objectives of the whole exercise. Many of these pressures remain with the producer of a television series permanently, but in due course a measure of control can be achieved so that more thought can be given to overall strategy and planning. The progress in this field in Glasgow can be divided into three stages:-

Stage 1. Starting in 1963 with less than 3 months' notice before the first broadcast, which was followed by nine more at monthly intervals, it was soon obvious that producers, programme selectors and participants lacked experience and time. There was too little time for preparation and for the mature consideration of the mistakes of preceding programmes which were often recurrent. Thus it was largely due to increasing experience and to the need for more time to rehearse and prepare programmes and to review material and performers that in 1965 a decision was made to concentrate the monthly broadcasts into two series of six weekly programmes, thereby allowing a period of six months to consider, rehearse and video-tape the series. This was what is here referred to as stage 2.

Stage 2. Having conceived the idea of broadcasting the programmes as a group largely for reasons of expediency, it was valuable to consider whether there were other valid purposes which could be served. A further practical consideration was the extension of the programmes to all the Scottish schools, to Newcastle and to a second television company. This made even more careful and timeous programme title and content selection essential. A different consideration was the great difficulty in reminding doctors that the programmes existed at all. Expense precluded a monthly postal reminder to each doctor, and the number reading the journals was too few to rely on that source of information. It was, however, possible to remind doctors twice yearly of a new series and to send them a programme for the following six weeks which might be more often recalled than a similar programme for the next six months. The series could be dressed up into an autumn or a spring "course", and the reminding literature could be enhanced by incorporating some reinforcement in the form of short programme summaries as well as information considered valuable but unsuitable for broadcasting.

This then was the strategy, and, from this concept of a course, there grew the idea of grouping similar subjects together e.g. "Emergencies", "Recent Advances", "Orthopaedics", "Paediatrics" - although occasionally some odds and ends had to be classified as "Clinical Memoranda". The evidence is that this is probably preferred by the viewers, but it is hardly strong enough to be too encouraging.

Stage 3. Here I leave the realms of reality and the present to make some personal suggestions as to how I should like to see these broadcasts develop if they are to continue. At the present time, influenced by the half-hour "slot" and the traditional television documentary, each broadcast is a "programme" on its own, only grouped with the others in a series by belonging to the same broad area of medical knowledge. The format is often structured more by the personality and whims of the chief participants than by either the needs of the "student" or by modern educational techniques as laid down by an experienced educational producer. What one would wish to achieve is a series of three to six programmes on one subject in depth - planned and arranged in a programmed learning sequence by experienced educators, from material supplied by the relevant experts. One would wish to see the students participating, moving from sequence to sequence and weekly programme to weekly programme. If this can be done, it would represent a real advance from amateurism to professionalism in the field of medical education in television. Then it will be proper to discuss programme strategy.

THE INTEGRATION OF EDUCATIONAL TELEVISION BROADCASTS WITH OTHER METHODS OF LEARNING

by

G.R.O. Walpole

This approach to continuing education was explored by the Victoria Faculty, Australian College of General Practitioners, in June 1968 as a part of its normal programme, and this report discusses the methods employed.

To be worthwhile, any plan for continuing education must motivate the 'student' by making him aware of gaps in his knowledge, help him to fill these gaps in a manner best suited to himself, and it must assess its effectiveness in changing behaviour or attitudes.

Orthodox methods, for instance clinical meetings, lectures and refresher courses, are often very poorly supported and tend to lack co-ordination as well as overall planning. Seldom is any attempt made to establish the educational needs of participating doctors or to assess the educational success of such meetings.

The integration of several educational methods can be compared to aiming several arrows at a target. Each method has a specific use and must be designed accordingly; written material for the transfer of information, audio visual methods and especially broadcast television to promote interest, motivation and changes in attitude, and, finally, active participation in the learning process for educational reinforcement.

The Project

The target audience was defined as actively practising general practitioners in Victoria, which has a total population of three million; two million live in Melbourne and its suburbs, the remainder in large and small country centres up to 350 miles from the state capital.

Table I. Statistics (approximate figures only)

Total number of doctors	= 4,000
Total number of G.P.s	= 1,500
Mean age of G.P.s	= 45.5 yrs.
G.P. : Patient ratio	= 1:2,000
Metropolitan : Country ratio (G.P.s)	= 2:1
Group practice : Solo practice (G.P.s) ratio	= 2:1

Despite the geographical isolation of some doctors, over 95% of all doctors own Television receivers.

The subject chosen for the project was Diabetes Mellitus, as it admirably fitted a current educational need.

The administration of the scheme became the responsibility of the Austrailian College of General Practitioners, as it appears at present to have a monopoly in the use of broadcast television for postgraduate education in Victoria. Previous experience, gained in collaboration with Mr. Charles Engel, enabled the College to design this project and to assume complete administrative control. A General Practitioner was designated as Executive Director in control of a Production Advisory Committee, comprising five General Practitioners, two Consultants in Diabetes, one Consultant in Education, one Dietician and a Television Production Executive.

The integrated approach was to make use of three major teaching methods as well as encouragement of audience participation and a planned follow-up. The whole scheme was based on the preparation of a booklet which was designed to be readable and to contain adequate practical information. The television scripts were prepared by concentrating on those aspects which were considered to be most suitable for television presentation. A concluding seminar was designed to give all general practitioners a chance to ask questions and to participate in open discussion. Reinforcement through audience participation was encouraged by including a Personal Assessment Questionnaire with the booklet, a Project Assessment Questionnaire and suitable space for posing two questions on Diabetes for submission to the medical panel to be answered in broadcasts or by mail. Follow-up will include the use of film copies of the broadcasts as stimulus to group discussion. An issue of the Medical Journal of Australia has been devoted almost entirely to Diabetes Mellitus. The assessment of behavioural change was attempted through questionnaires sent to all members of the Victoria Faculty two weeks in advance of the project, and re-submitted three months later. The questions concerned seven basic points treated in the telecasts.

Finance

The basic production costs included:-

i) Preparation of three video tapes, telecasts, and three film copies.	$2,622.50
ii) Satellite station replay costs (4 channels)	$645.00
iii) Preparation and printing of 3,000 booklets	$1,103.20
iv) Art work for telecasts and booklet	$435.00

The booklet proved saleable and helped to defray the cost of distribution. A generous grant of $6,000 was adequate to cover all aspects of the experimental project.

Methods

The Booklet was designed to play the following parts in the integrated approach:-

i) Pre-reading

ii) Guide to telecasts

iii) Substitute for missed broadcasts

iv) Permanent reference

v) Vehicle for aspects not suited to television.

With a minimum of background theory, the booklet presented all the information considered necessary for the detection of glycosuria and pre-symptomatic diagnosis of diabetes. A detailed presentation of three forms of treatment used for diabetes was given, as well as a list of common problems faced by diabetics which are usually managed by the family doctor.

All doctors in Victoria were sent a detailed programme of each broadcast two weeks in advance. This included a tear-off application form for the booklet, and advice that a charge of $1.00 would be made to non-College members, 310 copies were requested by College members, and 200 copies by non-College members. All, who replied to the questionnaire, (33), indicated approval of the educational level of the booklet and said they found it useful.

The Broadcasts were designed to demonstrate a need for change in attitude and behaviour rather than to give detailed information. It was intended that the broadcasts should engender sufficient interest to induce the viewer to read the booklet. This approach to the telecasts led to over-simplification of the subject matter, which received a mixed reception.

The audio visual presentation was restricted to specific vital facts:-

1) High prevalence of diabetes with pool of undiagnosed cases in the community.
2) Individuals at special risk.
3) Modern and simplified methods of diagnosis.
4) Confirmation of diagnosis by laboratory methods.
5) Simplified methods of prescribing carbohydrate restriction.
6) Use of oral anti-diabetic agents.
7) Practical aspects of use of insulin.

These points were then illustrated in clinical situations.

Three programmes were recorded, as the subject fitted into three logical compartments of equal length and importance:-

a) Diagnosis
b) Treatment
c) Practical application.

The use of adequate recapitulation and summary of content in each instance provided a practical link between the three segments.

Two consultants in diabetes, one dietician, one general practitioner, three 'volunteer' patients and six medical students participated in these programmes. The general practitioner provided the introduction, continuity and summary to help audience identification and the concept that the general practitioner is a partner in the academic team. 'Volunteer' patients were considered to be as useful as genuine ones, and the medical students considerably enlivened the clinical situations.

The three programmes were broadcast throughout Victoria by one city and four associate country stations at fortnightly intervals at 10.15 a.m. on Sunday morning. The third broadcast ended with an invitation to forward the completed assessment form.

The number of those who watched is not known. Of 33 replies, 80% approved of the educational level of the broadcasts and 20% indicated that the level was too elementary.

The Seminar was originally designed to give doctors an opportunity to ask questions and to participate in open discussion, and the subject matter was arranged to cover topics not dealt with adequately by the other methods. Four speakers were invited to present the epidemiology of Diabetes Mellitus in Australia, problems in the interpretation of Glucose Tolerance Tests, Diabetic Emergencies and Complications of Diabetes.

In practice the seminar became a symposium, and, although academically brilliant, was educationally out of character with the rest of the project. Although 100 doctors attended, audience participation was very small.

The Questionnaires were intended to encourage the viewer to play some active part in the learning process by obliging him to give an opinion, answer a question or refer to the Booklet. These questionnaires were sent out with the Booklet and consited of four parts:-

1) "Project Assessment" questionnaire to provide basic feed back.

2) "Personal Assessment" questionnaire to provide some stimulus for the viewer to test his own knowledge after each broadcast and to correct his answers from the booklet.

3) Provision of space for critical comments.

4) Provision of space for the submission of two questions to the medical panel on diabetes.

Only 31 replies (6%) were received, and only six viewers sent in questions.

This aspect may appear hardly worth the effort, but it is hoped to develop more sophisticated methods, such as multi-choice questions, research projects and the submission of case reports.

By coincidence The Medical Journal of Australia is to devote an issue to Diabetes Mellitus, and the booklet may be published in this issue. If this proves successful, it may be possible for future topics to be dealt with in this way by prior arrangements.

The accepted method of postgraduate education of the Australian College of General Practitioners is the group of 10-15 doctors, and the value of providing such groups with broadcast television or video tapes will be investigated.

DISCUSSION

The design of the integrated approach was considerably influenced by prior knowledge of yet unpublished research conducted in 1967 jointly by the Department of Audio Visual Aids, University of Melbourne and the Victoria Faculty Australian College of General Practitioners, the making of an "Assessment of Recall one month after viewing an Education Telecast".

In this experiment a film copy of a television broadcast was shown via close-circuit television. One month later a test was given simultaneously to 40 doctors who had viewed the film and 21 doctors who had not done so. The test was divided into two sections devoted, respectively, to
i) factual material presented in the film, and ii) controversial material presented in the film.

In the section concerned with factual content, there was no statistically significant difference in the results obtained by viewers compared with non-viewers. We were, therefore, obliged to assume that educational broadcasts may not represent a very efficient primary medium for the transfer of factual knowledge, unless combined with other methods of learning.

The appeal of a readily available and permanent reference became evident, and this was the original stimulus for the design of a booklet containing all the basic information about Diabetes Mellitus. The ideas for the broadcasts grew easily from the booklet by concentrating on stimulating visual presentation. The basic concept of combining a comprehensive booklet with broadcasts has thus enabled us to resist the compulsion to make television perform an educational task for which it may not be suited.

A separate problem concerned the sophistication of content. We firmly believe in the need to give the General Practitioner something he can readily appreciate. He may then be persuaded to study a text, providing he perceives the need to do so. A broadcast is one way of supplying such motivation, and the first segment of the Diabetes programme was designed to this end.

The Seminar should have helped a highly motivated doctor. Unfortunately it did not fulfil its desired function in the integrated plan, as a satsifactory level of discussion by direct audience participation was not achieved. This was due to faulty briefing of the participants rather than failure of the method.

The postgraduate programme of the Australian College of General Practitioners is now largely being implemented in Victoria in small groups which meet at regular intervals under the guidance of a group leader. It is anticipated that there groups can be offered learning opportunities in a variety of ways, including broadcast television backed by suitable pre-reading matter and booklets. This would lessen their present dependence on teachers and resource personnel. An attempt will be made to assess the value of this approach by using some groups as trial audiences to evaluate programmes before they are broadcast.

The simple attempt which we made to detect any evidence of behavioural change in response to exposure to one or more broadcasts, with or without the added influence of the booklet and seminar, may indicate the practicability of this approach.

Final proof of the effectiveness of the integrated approach is lacking, but it would appear to have considerable advantage over the use of broadcasts alone. Further assessment is also required of the value of integrating group methods of learning with broadcast television or video recordings.

Grateful acknowledgement for their personal help is made to Dr. M. Balson, Dr. H.D. Breidahl, Miss Diana Harcourt, Dr. F.I.R. Martin and Mr. A. Potter, and we are glad to acknowledge the generous material assistance provided by Ames Company (Division Miles Laboratores A.N.Z.), Australian Hoechst Limited and Herald-Sun T.V. Ltd.

POSTGRADUATE EDUCATION

AND THE TELEVISION BROADCASTER I

by

R. McPherson

Following an experimental medical teaching programme produced by Scottish Television in conjunction with the Department of Surgery of Glasgow University during a Conference in 1962, Scottish Television and the Glasgow Postgraduate Medical Board initiated open-circuit broadcasting in the field of medical education with a series which started in March 1963.

Since then some sixty-five programmes have been produced and transmitted, aimed at providing the general practitioner with refresher medical education in his own home. The Edinburgh, Dundee and Aberdeen Postgraduate Medical Authorities participate in the Scottish Television productions. Tyne Tees Television and the Newcastle Postgraduate Medical Board have for a considerable time been partners with Scottish Television in this activity. A Postgraduate Medicine Television Planning and Co-ordinating Committee (I.T.V.) has been set up and representatives of the two Television Companies and of the appropriate medical schools meet regularly.

The choice of subject material and participants is not an easy process. The needs of general practitioners have to be considered as a priority. It would be only too easy to fall into the trap of dealing exclusively with exciting "laboratory" or "hospital" developments that have little or no relevance to general practice in the immediate or near future situation. The power of television, in the sense that it swiftly distributes major teaching of new developments to a dispersed and often harassed profession, could be misapplied.

The ideal combination of teaching technique and the advantages of television, is not necessarily the result of a straight process of addition of these two elements. The successful lecture hall approach, for example, compares most unfavourably with the more intimate television style which makes the right kind of impact for home viewing. It is recognised, of course, that group viewing might well modify this contention. Both the programme presenter and the television producer have to do more than just co-exist. The optimum balance of production and instruction is only achieved when a positive basis of co-operation has been built, Sustained patterns of meetings provide a growing body of experience. Traditional teaching methods are re-examined. Several minds are brought to bear on draft scripts. Specialists returning to the screen for a second effort clearly gain from the previous experience. Research into needs as well as into effectiveness could have wider implications than those of direct feed-back value for the broadcasts.

The supporting literature, distributed since Autumn 1966 to all general practitioners in the reception area, and the supply to the Postgraduate Medical Authorities of 16mm. film copies of the programmes, both assist in providing opportunities for the reinforcement of the content of the initial transmissions. The present structure of programmes into an Autumn Term of eight broadcasts, one each week with a repeat in the week, and six broadcasts similarly treated

in the Spring Term, allows a staged course to be developed. It is hoped that this is a stronger approach than the earlier one of providing one broadcast a month.

Though the target audience has at all times been regarded as the general practitioner, research has shown that all grades of hospital staff view, as do many others whose work is connected with hospital and medical services.

A considerable lay audience also views the programmes, but there is little if any evidence of unfortunate responses.

Though only a small audience in broadcast terms is ever going to be available, the opportunity to be of service in attempting to bring new developments in medical science to the general practitioner has been welcomed not only by the Companies, but also by production staff. They recognise in the medical teachers a desire they share - the anxiety to communicate.

There is a danger in overstating the homogeneity of the viewing doctors. They differ in age, in the opportunities they have of keeping up to date, in special interests and so on. No programme, therefore, can be ideal in level and in method of presentation. A continuing fabric of positive criticism must be available if programme content and styles of production and presentation are to be progressively improved.

The growth in viewing attachment is encouraging. The optimism present in the membership of the programme editorial group - medical liaison personnel, medical artist and Company production staff - seems to be justified. The opportunities for this genre of broadcasting are considerable. Where there are limitations, they are recognised. Many of them have been, or are in the process of being overcome.

There are many pressures for air time for a whole variety of Adult Education pursuits. It is to be hoped that doctors will continue to build up their utilisation of postgraduate medical programmes and help in this way to ensure a continued service.

POSTGRADUATE MEDICAL EDUCATION AND THE TELEVISION BROADCASTER. II.

by

J. McCloy

In 1964 a group of doctors who were members of the Association for the Study of Medical Education approached the BBC and suggested that the Corporation should mount a series of programmes aimed at providing postgraduate refreshment and updating for in-service doctors. After a survey to determine the potential size of the audience in the London area, the series was commenced in January 1965. It was given the title Medicine Today, and was conceived as an experimental series of six half-hour monthly programmes on the new channel BBC-2, which at that time could only be received in the London area. Audience research showed a favourable response from the profession to these first programmes, and, in consequence, the series has run continuously ever since. To date some forty-five programmes have been transmitted. Since January 1966 each programme is transmitted at 13.15 hours, a time when General Practitioners in Britain are likely to be at home for luncheon, and the programme is repeated on BBC-1 a week later with a late night placing, usually at about 23.15 hours.

At an early stage it was decided that the programmes should be designed for, and aimed primarily at, the General Practitioner. Of General Practitioners in Britain over 50% qualified as doctors more than twenty years ago, 70% more than fifteen years ago. During the last twenty years there has been a continuing acceleration in the advance of medical knowledge. Doctors in all branches of medicine are required to make an enormous and continuous effort to keep abreast of new developments. The hospital doctor, particularly in his speciality, is in close and continuous contact with these advances. On the other hand, General Practitioners work in relative isolation, for the most part outside the hospitals. Yet these are the doctors who are exposed to the most rapid increase in knowledge in the widest field. They are confronted with the greatest number of new drugs, with new methods of diagnosis and new methods of treatment.

In general, conditions of service of General Practitioners militate against a majority making use of traditional methods and opportunities for continuing education. Only a small proportion of doctors in Britain or America attend any kind of refresher course after graduation. Moreover, there would be obvious problems in the provision of teaching manpower and other resources to meet the needs of a whole profession. The picture then, as it appears to an educational broadcaster, is of an enormous and changing field of knowledge to be covered for an audience that is scattered and isolated, combined with a need for a continuous educational provision rather than infrequent or periodic intensive courses. It seems likely, therefore, that television might well play a useful role in this area.

As the BBC series developed it became clear that the central problem in production was to establish proper communication between the consultants, who were inevitably the specialist speakers, and the General Practitioners in the audience. The sharp dichotomy which exists in the profession in Britain results in a very different medical emphasis. The vast majority of the illnesses with which the General Practitioner has to cope in his practice never reach the hospital consultant, perhaps 90%. Conversely, a large part of the hospital

procedure in diagnosis and therapy are outside the scope of general practice and of only marginal interest to the family doctor. A specialist invited to take part in a programme usually wishes to talk in terms of hospital medicine and is not fully aware of the different interests and needs of the family doctor. Moreover, accustomed to the teaching of medical students, he tends to treat this professional audience in the same manner. While this may be acceptable in a lecture-room situation on a refresher course, in which any audience tends to assume an attitude in statu pupillari, there seems to be a very different attitude in viewing a television programme at home.

The problem of ensuring a programme content strictly relevant to the specific needs of the professional audience has required continuous vigilance and firm editorial control. Highly qualified and distinguished specialist speakers are usually concerned to include in the programme what they consider this medical audience ought to want; or at least ought to know, irrespective of whether the tired, busy family doctor wants it or not. In this situation in which he is broadcasting to a fully qualified audience it seems that the educational producer is in the same "audience-building" situation as a general television producer. The audience is not motivated in the same way as an audience seeking basic qualifications and professional advancement from an educational programme. It is a highly critical and highly selective audience with considerable self-esteem, an audience that is easily offended by any trace of patronage. If a doctor dislikes a programme, he will simply switch off and, worse, may never bother to watch again.

Even when the content has been successfully tailored to the needs and interests of the audience, it has been found that there remains a number of psychological requirements in the presentation that must be met in order to win complete acceptance. For example, it is more acceptable to this particular audience if a specialist describes how he himself carries out a medical procedure, talking as one colleague to another, rather than demonstrating how it should be done in a didactic manner, the manner he would naturally adopt with his students. However firm the scientific basis there is still room for considerable controversy over treatment in a great deal of medical practice, and this is an important, if difficult, ingredient in the programme construction, since it not only tempers didacticism but it presents medicine as the dynamic changing subject that it is.

However adult and professional the audience for the programmes, there remain, of course, all the usual requirements of good educational television. Visualisation and demonstration, audience involvement, the creation of tension and suspense, all have their usual place. For example, a patient's history being taken in front of cameras can be so placed as to precede the information on the nature of the condition; by this means the audience itself will, one hopes, be induced to anticipate the diagnosis made later by the specialist. As far as possible, all the programmes are patient-orientated. Many specialists often wish first to establish a firm scientific basis before proceeding to clinical considerations. But for an audience whose main interests are clinically orientated it has been found better to begin with the patient as he presents himself to the doctor and to deal with clinical diagnosis, and only at a later stage in the programme bring in such science as may be necessary for an understanding of the condition or its management.

To summarise: The series in general concentrates on presenting new material with the emphasis on continuing education, avoiding any appearance of ab initio basic instruction. During the first two years some of the programmes attempted to deal with a number of short topics within a single programme, but on the basis of information derived from viewing groups of doctors the current practice is to confine each programme to a single topic. Indeed, to achieve even greater depth, the programmes now often attempt to deal only with a limited section of a subject. The selection of topics and the nature of their treatment are governed by the following considerations:

1. Topics in which there have been important recent advances or changes in outlook which most practitioners will not know or have not fully understood.

2. Topics about which a number of specialists consider most General Practitioners are inadequately informed. (The programme then concentrates discussion on points of ignorance or differences of informed medical opinion, rather than a revision of the whole subject.)

3. Discussion of problems that are still unresolved, so that doctors may obtain a balance of opinion on the current position.

4. Occasional clinical demonstrations (with patients) by specialists who are star performers.

The speakers and demonstrators in the programmes are medical specialists selected not only for their clinical and theoretical knowledge and medical authority, but also for their ability to communicate. Because of the split in the medical profession in Britain, the General Practitioner is always represented in the programme. This has been found greatly to facilitate communication between the two sectors of the profession and to ensure that hospital practice is related closely to the very different interests and needs of the General Practitioner.

Medical advice on the selection of subjects and speakers for the series has been provided by a special committee of the Association for the Study of Medical Education. This advisory committee has been strengthened by the inclusion of doctors of considerable medical authority and progressive outlook. Their collective authority covers most branches of medicine. Editorial responsibility remains with the BBC. An important ingredient in the advisory committee is three very active members of the Royal College of General Practitioners, one of whom is always present in the studio during recording. Their advice is essential in ensuring that the programmes are properly geared to the interests and needs of the target audience. A doctor, who is not at present in practice, is on contract to the BBC to assist in the preparation of the programmes. He has become skilled in television and introduces the programmes in the studio.

In 1964, when the possibility of mounting the series was being considered, there were many doubts expressed about the effect on the general public of broadcasting on open circuit programmes constructed specially for doctors. For the most part these objections can be grouped under three headings. Firstly, the programmes might encourage hypochondria or they might induce anxiety and fear. Secondly, many medical subjects might be quite unsuitable for showing in a situation where they are available to the casual viewer. The sense of propriety of the non-medical audience might be offended. Thirdly,

the programmes might interfere with the doctor-patient relationship. A doctor might be giving a different kind of treatment from that seen in the television programme by his patient. Or even more embarrassing, the doctor might not yet know of the new development the patient had seen in the programme. However scientific medicine has become there are still large areas where there are considerable differences of informed opinion and to show doctors disagreeing with each other on television might reduce the confidence of the public in their own doctors.

Such evidence as was available tended towards the view that hypochondria is not initiated in adult life and is not the result of exposure to medical facts. The induction of anxiety and fear is, however, a different matter. A considerable effort was made when the series was launched to minimise the recruitment of a lay audience. Not only was the series given the minimum of publicity, a bare announcement in the Radio Times and the press on the day of the programme transmission. The subject of the programme was, and still is, never mentioned in any publicity available to the layman. It was hoped that this would at least avoid people suffering from a particular illness making a point of watching a programme dealing with that illness. It was also hoped that the medical language and the basic knowledge assumed in the target audience would discourage regular viewing by any but doctors or nurses.

The eavesdropping audience has turned out to be up to three quarters of a million approximately. Nothing is known of its constitution, but there have been no more than a couple of dozen letters from patients or their relatives after any programme. There has been no response or criticism of any kind in relation to the suitability of what has been shown in the programmes. One lavishly illustrated programme was, in fact, devoted to anal conditions including haemorrhoids. While there are some obvious restrictions, for example one could not easily demonstrate the technique of vaginal examination on the screen, it has been found that consideration of the susceptibilities and proprieties of the lay audience has not proved to be any limitation on the provision of a full medical treatment of any subject.

The limitation on publicity has proved to be a much more serious handicap. With a monthly programme a doctor who, though he may wish to view regularly, can easily forget on which day the programme is being transmitted. The medical profession has itself done a considerable amount towards publicising the series in a number of ways, including the medical press, but this remains a problem which, of course, would not arise in the same way with a weekly programme.

With regard to the effect of the programmes on the doctor-patient relationship, there have been no adverse criticisms of any kind from the doctors and no opposition to the transmission of the programmes. One consultant remarked that if as a result of watching the programme a patient is better informed than his doctor, there are two ways of overcoming the problem: one is to make a point of watching the programme, the other is to be well informed and up-to-date without watching the programme. Only medical controversy has proved to be a minor problem in production. It seems that although the doctors do not now object to the exposure of different medical opinions on the screen, they are often very reluctant in a situation of confrontation to engage in the kind of frank argument that makes interesting television for the professional audience. Occasionally and unpredictably this can be achieved but usually it happens over dinner before, or after, the programme is recorded.

As with any serious educational television, it is highly desirable that the programmes should have some printed supplement. Put at its lowest level, the essential factual data, such as the names of drugs and recommended dosages, should be available to the doctors in a less ephemeral form. While the series was available only in the London area it was possible for the Association for the Study of Medical Education to print and send a leaflet ("Postscript") supporting the programme to all doctors who requested it. When the series was transmitted on a national scale on BBC-1 this was no longer possible. During the past eighteen months the British Medical Journal,* has published an article on the subject of each programme, and complementary to it. The specially commissioned article appears under the programme title, Medicine Today, and is timed to appear in the issue published between the first transmission on BBC-2 and its repeat on BBC-1. In addition to supplementing and often taking further the subjects treated in the programme the articles also serve to remind the audience of the coming transmission on BBC-1.

An encouraging development during the past two years has been a marked and steady increase in the formation of groups of General Practitioners meeting at local hospitals to view and discuss the programmes. The discussion after viewing is led by a consultant specialist in the subject of the programme. Most groups send in reports after the programmes and some are attended by members of the production team. The criticisms and comments of these groups of the target audience have provided a most valuable feedback. Their response has enabled the editor continuously to refine the content and treatment of the programmes to meet the needs of the audience.

* Discontinued

SAMPLE SCRIPT

MEDICINE TODAY

NO. 31

RESUSCITATION OF THE NEWBORN

RECORDING NO: VTM/6LT/43273 PROJECT NO: 3428/3405

RECORDING	SUNDAY 4TH FEBRUARY 1968
TRANSMISSION	TUESDAY 23RD APRIL 1968 (BBC-2)
REPEAT	WEDNESDAY 1ST MAY 1968 (BBC-1)

PRODUCER	JAMES McCLOY
DIRECTOR	MARY HOSKINS
ASSISTANT	
F.M.	
T.M.s	
SOUND	
VISION MIXER	
CREW	
DESIGNER	
FLOOR ASSISTANT	

STUDIO: RIV.2
T.K.24 from 2 p.m.

Rehearsal	1.30 - 4.00
Tea	4.00 - 4.30
Rehearsal	4.30 - 6.30
Dinner	6.30 - 7.30
Line Up	7.30 - 8.00
RECORD	8.00 - 9.15

CONTRIBUTORS

Dr. H.B.
Dr. D.H.
Dr. C.G.
Dr. P.W.

RUNNING ORDER 'MEDICINE TODAY'

PAGE	SEQUENCE	DURATION	RUNNING TOTAL
1	Opening film and titles Dr. P.W's intro.	1' 25" 20"	1' 45"
1	Dr. B. - what happens in first 2 minutes	2' 00"	3' 45"
2	Dr. P.W. - intro. to Dr. H.	30"	4' 15"
2	Dr. H. - physiology	7' 00"	11' 15"
2	Dr. B. - demonstrates intubation: incl. film doll model	6' 00"	17' 15"
3	Intubation film	3' 00"	20' 15"
3	Dr. B. - comments in resuscitation bay	2' 00"	22' 15"
4	Interview - Dr. G.	3' 00"	25' 15"
4	Discussion inc. closing titles	4' 00"	29' 15"

FADE UP

1. T.K.24 : FILM SEQ. 1
Resuscitation - short version
Dur: 1' 25"

W: (over film) This is an emergency that actually arose at Hammersmith Hospital some time ago when our film camera crew was standing by. The baby was born asphyxiated - it hasn't yet taken a breath - and it would certainly have died if endotracheal oxygen hadn't been given.

S/I

2. 2 A
CAPTION: Medicine Today

lose 2

S/I

3. 4 A
CAPTION: A programme for Doctors

lose 4

4. 4 A
MCU Dr. W. seated in discussion set

We'll look at the whole of that remarkable film later in the programme with Dr. H.B., a consultant paediatrician at C.C. Hospital. Dr. B's. article on resuscitation of the newborn in the Lancet in 1963 set out a timetable of things to be done if a baby doesn't breathe, culminating in intubation. So, to begin this programme, which is about resuscitation, let's hear what he thinks should be done as soon as the baby is born.

5. 1 A
Dr. B. standing behind demonstration table with doll on table

B: / explains what he does at birth.

INTERCUTTING AS DIRECTED WITH

6. 2 A
Clock & apparatus

a) Notes time on clock

and

7. 3 A
CU Doll

b) Clears nose, mouth and pharynx (also stomach in hydramnios, diabetes & caesarean sections)

c) gives nalorphine if desirable

ending on 1

d) Oxygen by funnel if regular respiration doesn't begin at once.

(on 1)

8. 4 A — MCU Dr. W.

/CAM 3 to POS B./

W:/Before we go any further, let's consider what's going on in this baby. It isn't at all obvious why a newborn baby should breathe at all, and, in fact, it's only very recently that physiologists have begun to explain these first few breaths. Dr. D.H. is a paediatrician at G.O.S. but until quite recently he'd been doing research on the physiology of newborn babies at Oxford and it seems to throw a good deal of light on what we should do to help distressed babies in practice.

9. 3 B — CMS Dr. H. seated at desk, screens in right background.

H:/Gives physiological basis for what is being done. Makes 3 points.

a) Expansion of the lung.

INTERCUTTING WITH

10. 4 A — CU diagram - lung expansion

b) Onset of breathing. Refers to diagram on desk.

11. 3 A — CMS Dr. H.

c) The switch from foetal to post-natal circulation.

PAN HIM TO MAGNETIC BOARD

INTERCUTTING WITH

12. 2 A — CU Magnetic board.

Refers to diagram on board

ZOOM IN AS DIRECTED.

13. 1 A — CMS Dr. B. behind table.

Looks at clock. Says what happens at 2 minutes.

Doll, sectional model and head on table.

You can do mouth-to-mouth and mask-to-mouth

/CAM 3 to POS A /

14. 3 A — CU Mask and portable oxygen.

Shows mask & portable oxygen.

15. 1 A — CMS Dr. B.

But the best thing is intubation.

(TK next)

(on 1)

16. 1 A — Demonstrates correct position for intubation on doll
CMS Dr. B

17. 3 A
CU doll in correct position for intubation

18. 2 A — Moves to sectional model and demonstrates with laryngoscope
CU Sectional model

19. Plasticine model of tongue and epiglottis

20. 1 A — Moves to model of head with larynx and demonstrates
CMS Dr. B. and model head

INTERCUTTING WITH

21. 3 A
CU model's mouth and laryngoscope being placed in position.

Comments on placing of tube

22. T.K.24: FILM SEQ. 2
Interior of model's larynx & tube going in
DUR:

23. 1 A — Now, let's see again how it's done in a real life situation.
MCU Dr. B. and model head

24. T.K.24: FILM SEQ. 3 — Sound on Film
Intubation of newborn baby, H. Hospital
DUR: 3' 00"

/CAM. 3 to POS C/

25. 1 A — Comments further on film if necessary and explains content and lay-out of resuscitation bay.
CMS Dr. B. standing by resuscitation tray
INTERCUTTING WITH

26. 2 A
CU equipment in bay.

(4 next)

(on 2)

27. 4 A — W:/Introduces Dr. G. and interviews
CMS Dr. W.
INTERCUTTING WITH — him, on problems of intubating in

28. 3 C — general practice, equipment, etc.
MCU Dr. G.

and

29. 1 B
CUs doll, laryngoscope
and other equipment

30. INTERCUTTING AS DIRECTED — W. turns to Dr. B. and Dr. H.

2B Group shot & — and opens general discussion
MCU Dr. H.

1B MCU Dr. B.

3C MCU Dr. G.

4A MCU Dr. W. & group shot

ending on 4

TAPE:
Serenade for Strings

31. 3 C
ROLLER CAPTION

HOLD ON EDITOR'S NAME

FADE SO
F A D E S O U N D A N D V I S I O N

POSTGRADUATE MEDICAL EDUCATION AND THE TELEVISION BROADCASTER III

by

J.R. Parker

The potential of broadcast medical educational television is almost unlimited. We, who are professional programme makers and broadcasters, have shown that this potential is capable of realisation.

Its limitations can be divided into three main groups - the first two definite and real, the third largely imaginary.

1. The television facilities and separately, the air-time.

   The television facilities are expensive of capital and operating costs. By 'facilities' is meant sophisticated, modern electronic equipment and the necessary expert staff to maintain and operate it. So, for instance, the recording of moving capillary microscopy, previously regarded as impossible, proved successful by using the expertise available in a broadcasting company's engineering and production departments. The availability of air-time is limited because of the very highly specialised nature of the programmes - and the very highly specialised nature of the audience for which it is intended. The programmes do not have, and should not have, an appeal to the 'lay' viewer.

2. The unfamiliarity and even antipathy of the conservative medical profession to what is to it a completely new medium of communication.

   The precepts of the lecture theatre and printed articles are largely irrelevant to the intimate "presence" of an expert in a stranger's sitting room. The assumption of the medical lecturer/writer of the willingness of his audience to absorb his every pearl of wisdom ill-equips him to address a solitary General Practitioner, may not immediately accept that the hospital doctor's area of speciality has any direct relevance to his daily problems. Most medical educators are peculiarly unable to think of their subject in terms of this, to them, new visual medium - now thirty years old, although the very nature of medicine would seem to lend itself extraordinarily well to visual presentation. Partly, perhaps, because of television snobbery - "I wouldn't have it in the house" - many medical academics show less understanding of the ethos of television than do their school-age children.

3. The traditional reserve of the medical profession and the hesitancy of television broadcasters to risk offending public sensibilities.

   With the vastly increased awareness of current affairs and the explosion of general knowledge among the public, the traditional medical ethic of never telling the patient would seem to be becoming less and less appropriate to today's society.

   The tradition of anonymity was suitable to the printed word but simply draws attention to the convention on open circuit broadcasting. Calling a friendly consultant "my colleague" in the privacy of somebody's sitting room sounds

coy. The broadcasting Acts and certain self appointed arbiters of public well-being, have tended to make broadcasting authorities hesitant to risk offending public sensibilities. In fact, the public will accept far more gore and what is considered "private" than most authorities will allow. "The Birth of a Baby", "Your life in their Hands" and other examples have long made it difficult to imagine anything the public would not accept, if it is presented in a sincere and serious way. Concern about "suitability" for specialist information programmes is grossly exaggerated.

I feel that the fourteen programmes, with which I have been concerned, have proved that medical education can use the services of professional broadcast television and should do so. If medical authorities want this service, they will have to devote as much time and enthusiasm to their part in providing it as television authorities have shown themselves ready to do.

PART II RECORDED TELEVISION

ELECTRONIC VIDEO RECORDING AND REPRODUCTION (EVR)

by

J. Wren-Lewis

EVR is the shorthand name for a development which should reduce the cost of mass-producing audio-visual recordings dramatically, eventually to the same order of cost as gramophone records. It is therefore likely to be of considerable importance in accelerating the use of television techniques in medical education.

As far as the user is concerned, EVR comprises:-

(i) A device known as an EVR teleplayer. Rather like a medium-sized record-player, it is designed to plug into the aerial socket or the video input-jack of an ordinary, unmodified domestic television receiver; and

(ii) EVR telecartridges for playing pre-recorded programmes of sound and vision through the teleplayer. These telecartridges look rather like 7" reels of audio-tape, but contain special microfilm, sealed against dust, on which audio-visual programmes have been photographically printed from a special master micro-recording produced by an electron beam process.

It must be emphasised that EVR is not a substitute for video-tape for users who wish to make their own records from off-air programmes or from closed circuit television cameras. It is essentially a means whereby any owners or producers of audio-visual programmes, whether they be TV companies, film companies, or small film-makers such as medical film units, may have copies reproduced for widespread distribution at cost rates which, even in the first stages of manufacture in 1970, should compare favourably indeed with video-tape. The quality of reproduction, both of sound and of vision, is as good as can be obtained from any TV set, and well in excess of that of most broadcast television. Sound is carried in a form which makes dubbing particularly easy. Teleplayers will be of the same order of cost as TV sets.

In addition to its cost advantages, EVR has certain additional features which are likely to be particularly valuable in the educational field.

1. With a simple control button on the teleplayer the telecartridge can be stopped at any point in its play, so that any particular individual frame of the recorded programme can be held still for special study, without loss of quality.

2. Fast forward- and backward- wind mechanisms are available to make it easy to locate a frame of particular interest, and the player is equipped with a hand-control, so that the film can be advanced frame by frame.

3. As a consequence of these facilities, the system offers unusual opportunities for the storage of visual and sound information. Large numbers of still frames containing diagrams or special illustrations, which can be studied in relation to the explanatory sound commentary, can alternate with pages of print and sequences of moving pictures.

4. Both teleplayers and telecartridges are highly portable. Teleplayers resemble medium-sized record players in both size and weight, and hence can be carried readily from building to building or room to room, where they can be used in conjunction with any TV set. Telecartridges have standard size of 7" x $\frac{1}{2}$" with varying lengths of film, made possible by varying the size of the central boss. The cartridges are somewhat lighter than corresponding reels of audio-tape, so that postal dispatch is an easy matter.

5. The teleplayer is if anything easier to operate than a gramophone record-player, as the threading of the film is automatic, once the cartridge has been placed in the teleplayer and the "play" button pressed.

6. Because the viewing system is a TV screen, there is no need for black-out or special preparation of the room. At the same time, a single EVR teleplayer can feed four television sets or can have its output fed into a closed circuit television system, so that EVR combines the virtues of "individual involvement" (with the small screen, stop-frame facility, ease of operation, etc.) with the ability to cope with large audiences where necessary.

7. Because telecartridges are opened automatically under sealed conditions, and viewed with a low-energy scanning device, the life of the film is very much greater than that of standard film. An individual cartridge should be capable of many hundreds or even thousands of plays without deterioration.

Telecartridges will be prepared from original material recorded on either film or video-tape, and the conversion will be undertaken at a factory at Basildon in Essex operated by the EVR Partnership, which has been formed by the inventors (the Columbia Broadcasting System of the U.S.) together with ICI and CIBA to market the system throughout the world outside the U.S.A. and Canada. Teleplayers will be made, supplied and maintained by normal TV manufacturers, under license from the EVR Partnership.

The system is applicable to colour TV, but is initially being made for black-and-white in view of the shortage of colour TV receivers and the much lower costs of producing original black-and-white programmes, both on film or video-tape. The standard EVR telecartridge contains 750' of special 8.75 mm. film, divided into two tracks. When the system is used in colour, one track will contain picture signals, the other special signals for operating the colour apparatus of colour TV sets. In black and white, however, both tracks can be used for independent programmes, so that a standard 7" cartridge, which plays through once in half an hour, can contain two separate half-hour programmes in black and white. Switching from track to track is possible in the course of play, which may offer interesting features for educational purposes, for instance some form of branching in a learning programme sequence.

VIDEO TAPE RECORDERS

by

B. R. Webster

Some of the problems of recording information are already well known to members of the medical profession through such devices as the E.C.G. and E.E.G. When using these machines a higher quality recording can usually be obtained by increasing the rate of movement of the recording paper. This is in effect increasing the available area of recording material (i.e. paper) on which the desired information or signal is stored. With a relatively small quantity of information this presents no real problem, only an occasional pile of paper on the floor.

To produce a high fidelity sound recording of a full orchestra we need to store and faithfully reproduce an undistorted version of all the complicated waveshapes produced in a frequency range of more than 10 octaves extending up to 20 kc./sec. with considerable variations in amplitude. This requires the information to be stored in a material capable of high density packing, magnetic tape is therefore preferred to paper. At the same time a considerable area is still required and $\frac{1}{4}$" wide sound tapes are drawn past the recording heads at speeds up to 15 inches per second.

A television picture is produced by an electrical signal which has to contain far more information. Its frequency range extends over 18 octaves up to 5.5 MHz (Mc./sec.). This shows that television requires a bandwidth of some 200 times that needed for HI FI sound.

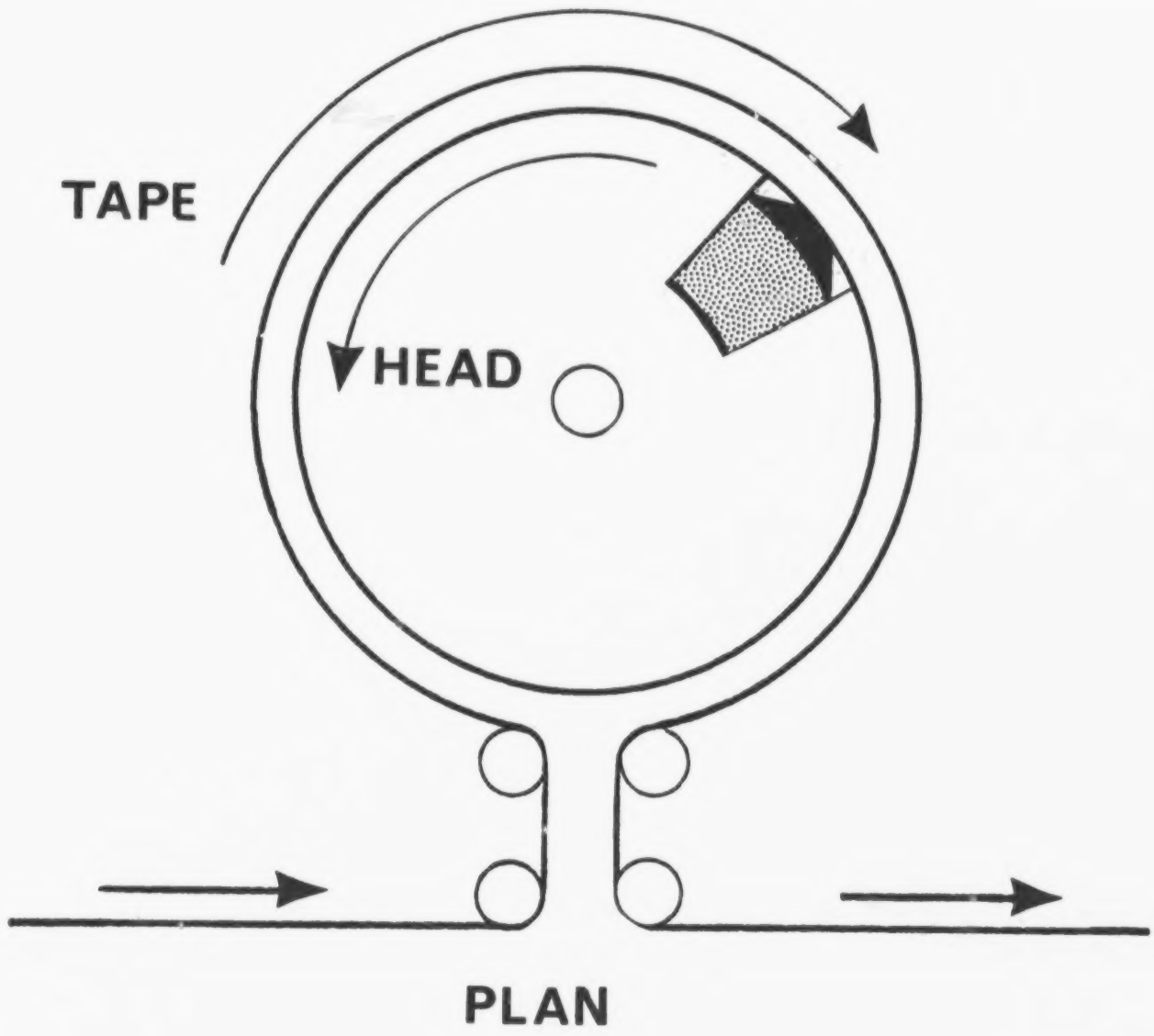
Imagine increasing the speed of a normal sound recorder to cope with this increase in the information to be stored. We would need a speed of 15 x 200 = 3,000 inches per second or well over 100 m.p.h. and of course, more than a hundred miles of tape to record one hour's programme.

An alternative is to increase the effective speed by moving the recording head relative to the moving tape. We can also improve the position by using more than one recording head and by using a wider tape.

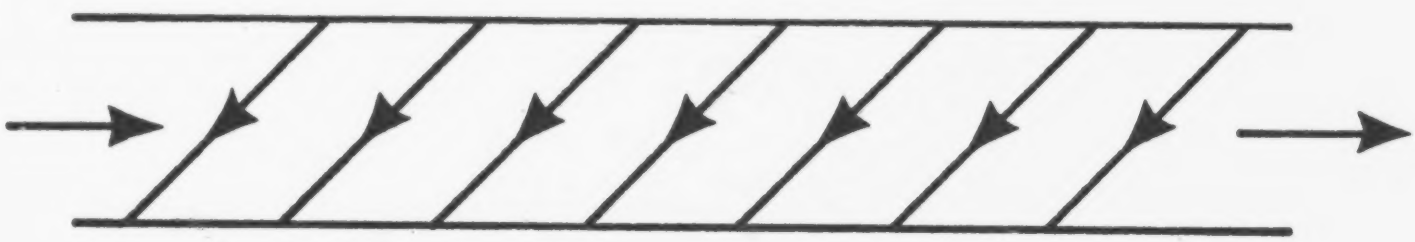
In the video-tape recorders used by broadcasters a standard has been universally adopted. These machines use 2" wide tape moving at 15 i.p.s. with 4 heads spinning across the tape 250 times per second. They cost £15,000 to £50,000 and need a further £50,000 for cameras and other equipment to justify their use.

In the far less expensive Helical Scan or Slant Track machines, one or two heads are spun about a fixed axis while the tape is pulled along a helical path around the same axis (Fig. 1).

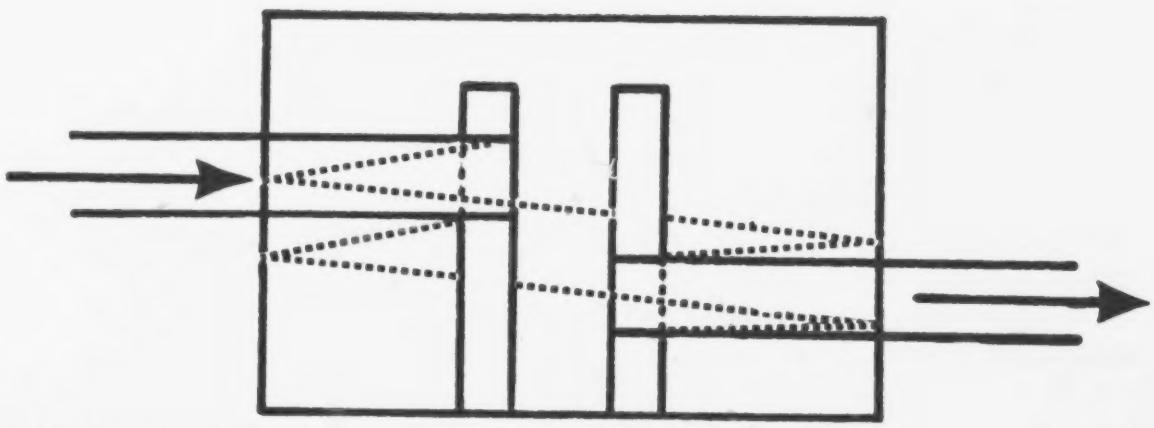
Such techniques produce excellent results and represent a very remarkable engineering achievement. However, they all impose some limitation on the recorded bandwidth. A 625 line picture produced by the B.B.C. employs a bandwidth of 5.5 MHz. Helical scan V.T.R. manufacturers are currently claiming bandwidths ranging from 2.0 MHz. to 5.0 MHz. these are roughly equivalent to 200 to 400 lines of horizontal resolution respectively.



PLAN



VIDEO TRACKS ON THE TAPE



ELEVATION

Figure 1

The reduction in picture detail produced by the bandwidth limitation is comparable with the use of a larger mesh in the printing of photographs, where fewer dots mean less detail. For any given mesh size the picture clarity could also be affected, if a number of the dots, randomly distributed, were incorrectly inked. This is the case when the television picture is subject to electrical interference or noise. Therefore another important parameter of the video tape recorder is its Signal to Noise Ratio; 40 db is a typical value. Under certain conditions lower values may cause some loss of picture clarity.

Table 1 shows a selection of helical scan video tape machines chosen from more than forty models. A range of different bandwidth figures are quoted. How important are these differences in deciding the choice of a machine? This should depend upon the type of use for which it is intended. If it is to be used entirely for recording and replaying broadcasts then the material seen is unlikely to lose much through recording and replay, if it is remembered that many domestic receivers give subjectively acceptable results although they are incorrectly tuned and therefore reproduce only a restricted bandwidth. If the video tape recorder (v.t.r.) is to be used in conjunction with a closed circuit installation then the required bandwidth should be decided by consideration of:-

(1) The other equipment, particularly cameras, to be used.

(2) The usual material to be presented.

In educational television it is hard to find a subject, with the possible exception of microscopy, where the required clarity of view cannot be achieved by production rather than electronic techniques. Better lighting and a closer shot can usually far outweigh the differences produced by a reduction in bandwidth. Economic factors and other features of a machine should therefore be given equal consideration.

In some situations e.g. outside broadcasts and certain industrial applications of closed circuit television, the picture content and quality are not under the control of the producer. It is therefore very important that the v.t.r. does not cause any loss of definition. The televising of an operation may be regarded as equivalent to an outside broadcast; another example of this in the medical field would be the recording of the output from X-ray image intensifiers where the picture quality is already restricted by the need to limit the patients exposure to X-ray.

The National Educational Closed Circuit Television Association (NECCTA) has drawn up a list (available on request) of user requirements based on a very wide range of experience with E.T.V. The first of these is complete compatibility. At the present time only the quadruplex machines used by the broadcasters are completely compatible i.e. able to exchange tapes between different machines from different makers. If a universal pattern could be adopted by the manufacturers so that they all used one tape deck with a standard width tape moving at a fixed speed past a head spinning at an agreed rate, then all users in future would be able to exchange tapes freely. There would then be a much better chance of establishing libraries of recorded material.

At present most manufacturers guarantee compatibility between their own machines, some are beginning to introduce a range of machines with a single tape deck but a variety of electronic facilities, and the I.E.C. who organise international standards have got as far as agreeding that all tapes should be $\frac{1}{2}$", 1" or 2".

Table I Some Video Tape Recorders October 1968

Maker's Name	Type No.	Tape Width	No. of Heads	Bandwidth in Mc/s.	S/N Ratio in db	Max. Reel Size	Time for this Size in Minutes	Weight in lb.	Other Features	Price in £
Ampex	7003	1"	1	3.5	40	$9\frac{3}{4}$" (3000')	60	100	Slow Motion. Two audio tracks. One of a range of compatible models. (5003 at £795; 7800 at £4,650).	1400
Beulah (National)	NV-1020E	$\frac{1}{2}$"	2	2.0	40	7"	45	51	Audio dubbing.	398
International Video Corporation	1VC 800	1"	1	4.2	Not quoted	8" (2150')	60	52	Stop Motion. Two audio tracks. (Slow motion and editing available). One of a range of compatible models. (A machine with PAL colour, electronic editing and slow motion at £2,500 approx.)	1500
Peto Scott Philips	ET 2610	1"	1	3.2	35	9"	60	100	Stop motion available. Recently reduced in price by more than 50%.	400
Rank Nivico	KV 800	$\frac{1}{2}$"	2	2.5	40	8"	63	66	Audio dubbing.	360
Sony	CV 2100 E	$\frac{1}{2}$"	2	2.4	40	7"	40	44	Stop Motion Audio dubbing	385
Shibaden	SV 700V(E)	$\frac{1}{2}$"	2	3.0	38	7" (2400')	70	53	Audio dubbing. Stop Motion.	495

All above are 625 line or dual standard machines.

The list, which is arranged in alphabetical order, is a selection from more than 40 known machines.

Other features which might be of vital importance for any particular task are:-

(1) Size and weight, particularly for mobile work (one model weighs 11 lb. only)

(2) Colour recording capability

(3) Sound track dubbing and/or second sound track facilities

(4) Maximum recording time

(5) Slow motion and/or stop frame facility

(6) Electronic editing capability - important for teaching presentations

When considering the relative costs of different machines, it is important to allow for the cost of tapes. For most purposes an initial stock of at least 20 hours of tape is essential and this should be allowed for in the initial choice.

EXAMPLES:

(a) 8" reel of $\frac{1}{2}$" tape for No. 5 (Table 1) costs £18. 10. 0d., so that 20 hours of tape for this machine will cost £370.

(b) $9\frac{3}{4}$" reel of 1" tape for No. 1 (Table 1) costs £26. 10d. 0d., therefore 20 hours of tape for this machine will cost £530.

It should be remembered that cost may well be a significant indicator of quality, reliability and versatility. Unnecessary expenditure on too good an instrument may be as wasteful as too little spent for equipment which is not good enough for the intended purpose. It will always be wise to consult an expert before placing an order. This is particularly important in view of the rapid improvements in design and manufacture of video tape recorders.

Summary

1. Be careful to identify needs before going to a manufacturer.

2. Remember for people, physiotherapy work, etc. bandwidths below $\overline{3MH_z}$ may be adequate.

3. For other recording work a more precise specification is needed and a number of factors must be considered.

4. Rapid developments are still in progress so take care that your information and prices are up to date.

5. Please help NECCTA to help you by creating a national demand for a standard tape deck.

INVOLVING THE VIEWER IN POSTGRADUATE MEDICAL TELEVISION

by

R. D. Judge

A number of significant lessons have been learned from experience with post-graduate television programmes for continuing physician education. This paper will attempt to enumerate a few of the major features which apply primarily to the development of viewer involvement. Active participation on the part of the student is too often overlooked when the teacher plans and produces a television presentation. The principles described herein have been derived from recent experience with the production of the first in a series of eight videotapes entitled Diagnosis Please: A Video Clinic on the Differential Diagnosis of the Systolic Murmur.

SELECTION OF TOPIC

The strategy of viewer involvement begins with selection of the topic, and, in fact, with the selection of the title, which is vitally important. If a title such as Clinical Aspects of Gout or Ventricular Septal Defect is chosen, the teacher immediately starts down the road of passive viewing, because he has already given his audience the diagnosis and, therefore, has removed the basic structure of the diagnostic process from his presentation. This is not always bad, nor is it invariably true that viewer participation requires a CPC approach. Nevertheless, it is usually easier to maintain viewer interest if a certain element of anticipation and mystery is preserved.

In the case of Diagnosis Please, a clinical problem was selected. It was a general problem - that of the differential diagnosis of the systolic murmur. Any general topic, such as anemia, fever or backache, which designates a common clinical problem would be equally suitable.

SELECTION OF MEDIUM

As with motion picture film, television is necessary primarily when a moving image is required. It is important for the teacher to consider at the outset whether motion contributes an indispensable dimension to his presentation. If not, a simpler mode, such as slides and audio tape or a filmstrip with programmed sound track, should be equally effective and far less costly.

In this case, there were three points where a moving image was definitely an asset. The first was the history taking sequence, where an increased sense of reality was established by virtue of recording on video-tape. The second was the demonstration of surface pulsations in the neck and over the precordium. The third was the cineangiogram which showed the jet of contrast material passing through a stenosed pulmonic valve - it demonstrated the pathophysiological basis for the murmur far better than any other visual presentation could have done.

Other reasons for selection of television, such as image multiplication or electronic image transport, may also be important under certain circumstances; but the key question that the teacher must ask himself is, "Do I want the action?".

DETERMINING OBJECTIVES

Once the topic and the medium have been selected, the teacher should identify his objectives. This, of course, has practical importance, since it deeply effects the general level of sophistication of the included materials as well as the approach and sequence of presentation. The first question here is, "At what audience should I aim." For Diagnosis Please, the answer was, "At the practicing clinician who wrestles with the problem of systolic murmurs on a regular basis."

Three major objectives were then determined. The first was to modify the viewers clinical approach to the systolic murmur by placing the murmur in perspective with respect to other clinical and physiological information. It was hoped that the viewer's general approach to the patient with the systolic murmur would gradually be upgraded. This would require de-emphasis of the murmur itself and emphasis on other diagnostic factors which were correlated with the murmur.

The second objective was to transmit some information. This was perhaps a secondary objective, but it was hoped that a few new facts might be hammered home with each video-tape presentation. Some of these facts would be reinforced by subsequent presentations; others would be reinforced immediately by pathophysiological correlation.

The third major objective was to improve the viewers ability to observe, identify and interpret key clinical findings. Again, the correlation of clinical bedside manifestations with underlying pathophysiology was the chief mechanism for the attainment of the objective.

A fourth objective, which was less simple to identify, had to do with the decision making process. Regardless of the final diagnosis, the demonstration of key factors, which are important in making critical decisions along the way, must be described and correlated. A handout, the text explaining the reason for each correct answer, was the mechanism selected to explain the basis for these key decisions. By contrast, it was considered unimportant whether the viewer made the proper diagnosis. The objectives described above were only secondarily related to the attainment of the correct diagnosis. The decision making process involved in each step of the presentation was, itself, far more pertinent.

PRODUCTION STRATEGY

The strategy of video-tape production was then planned to involve the viewer, to make him participate and to force him to commit himself. The medical expert selected an appropriate case which provided a suitable challenge. He made sure that it was representative of a disorder which featured the selected topic, in this case the systolic murmur. All the necessary clinical information was reviewed to make certain that the case had been adequately documented. A compilation of all the diagnostic materials, including electrocardiogram, chest x-ray, cineangiogram, pressure tracings, dilution curves and other data, was made to insure that it was satisfactory for television presentation. Some was retained and some was discarded.

At this point, the first meeting with a television expert was called, and the video-tape programme was blocked out according to a logical sequence. The key factors considered in mapping the design for Diagnosis Please were as follows:

1. Withholding the final diagnosis - in order to stimulate viewer interest, the problem would be presented as a diagnostic challenge.

2. Statement of the problem - this would be done in the form of a "tease". The viewer would be allowed to listen to the murmur while at the same time he would see the chest x-ray of the patient. He would be given the opportunity to make a snap diagnosis while at the same time he would be told about the subsequent presentation of material.

3. Segmentation - the material was then divided into logical segments, and the strategy for presenting each was devised. In Diagnosis Please these included: History, physical findings, chest film, electrocardiogram, clinical diagnosis, catheterization data, cineangiogram, surgical findings, final result. The sequence here is flexible. It can be modified at the discretion of the medical expert. As long as all of the elements are ultimately presented, there is no reason why the history need be the first piece of data presented. In fact, for the sake of interest, it is planned that subsequent vidio-tapes will begin with an electrocardiogram, a chest film, or even an interesting piece of physiologic data obtained at cardiac catheterization. As long as the viewer ultimately has an opportunity to analyze all the essential elements of the case, the order of presentation is not critical.

4. Brevity - time limits were now placed on each sequence, in order to insure that the total duration would not be excessive.

5. Simplicity - one or two major points were selected for presentation in each segment, keeping in mind that the viewer would have limited time to assimilate the material and would, therefore, be particularly susceptible to confusion by an overly complicated exposition of the data.

With these production goals clearly outlined, the physician-teacher and the television expert set out to record the necessary material. This was done in the form of short units. The patient was asked to be present only in those segments in which he appeared. After these were concluded he was excused and additional segments were produced. Some of these required the assistance of a medical illustrator in order to insure proper emphasis and clear exposition. This meant that taping extended over a period of several weeks.

REINFORCEMENT

A number of literary and visual forms of reinforcement were now brought to bear on the final production. In Diagnosis Please these consisted of the following:

1. The construction of a case history which could be read by the viewer prior to exposure to the video-tape material. This case history included a number of ancillary but nevertheless important features which would not be considered in detail on the video-tape. It would "brush in" the background rapidly.

2. Selection of questions was next determined. Each basic segment was reviewed and an appropriate question constructed which referred to precise material demonstrated therein.

3. Confirmation of the diagnosis was next. Appropriate physiological information, which corroborated the clinical diagnosis, was presented in such a way that it explained the previously presented findings. In Diagnosis Please, for example, catheterization findings such as the presence of a large A wave in the right atrial pressure pulse was correlated with the previously demonstrated pulsation of the jugular vein as shown in the patient's neck.

4. A montage of short excerpts was then assembled beginning with the final confirmatory study and working backwards through all the data, interrelating each significant element.

5. A written syllabus was then assembled which included the correct answer for each question asked followed by two or three paragraphs of discussion explaining the basis for the correct answer.

6. A bibliography of current reference material was finally compiled and added to the syllabus.

When a number of video-tapes are assembled into a series, an additional and very important means of reinforcement is made available. Assuming that the subsequent video-tapes have a common theme with the original one (in this case the systolic murmur), similar elements can again be presented. They will require identical observations and conclusions on the part of the viewer. This, then, takes advantage of reinforcement by repetition; it also builds into the series a rather sophisticated means of evaluation.

EVALUATION

Evaluation becomes relatively simple due to the careful selection of the topic and the medium, the determination of objectives, attention to the strategy of production and the exploitation of the printed word as well as the video-tape for reinforcement purposes.

The instructor is provided with an immediate score which is in itself one means of evaluation. This score represents how well each of his viewers has done in answering the various questions. Scores of subsequent tapes in the same series will have even greater pertinence. By building similar questions into subsequent tapes, the teacher is given an opportunity to test recall. If, for instance, a parasternal lift is demonstrated in tapes one, four, seven, and eight, and in each case the student is required to observe and interpret this finding, a review of the test responses of the viewing group for each of these tapes may show pertinent evaluation information on how well the message is coming through.

Each student is asked to fill in an evaluation sheet, and this feedback has already lead to several modifications of the basic format. For example, student reaction demonstrated the need for including normal findings for comparison with the abnormal ones in the review section of each tape. Viewers also requested that visual materials be included in the syllabus which would remind them of the key findings which had been originally demonstrated by means of television. In other words, a copy of the key electrocardiographic, radiographic, cardiac catheterization findings, or a phonocardiogram demonstrating the characteristics of the murmur, might be included in the handout.

DEMONSTRATION OF VIDEO-TAPES

Professor M. Klingler introduced the first experimental colour video-tape produced in Britain for F. Hoffmann-La Roche of Switzerland. This company is investigating the practicability of introducing professionally produced video-tape programmes for postgraduate education, not only in Great Britain but in other countries of Western Europe. Hoffmann-La Roche have already gained some experience in this field through their sponsorship of the Network for Continuing Medical Education 342, Madison Avenue, New York, which makes black and white video-tapes available on a free loan basis to hospital centres in the United States of America. These tapes carry some product advertising, and similar material was included in the colour presentation on Carpal Tunnel Syndrome shown at B.M.A. House.

Dr. P. Byrne and Mr. K. Hoole of the University of Manchester presented excerpts from video-tapes on the basic sciences which are being produced in the University Television Centre to explore how recorded television may be able to help those who are preparing themselves for the first of the postgraduate qualifying examinations.

A black and white film of a colour video tape recording was introduced by Mr. C.E. Engel on behalf of Dr. R.D. Judge of the University of Michigan. This recording demonstrated an entirely new approach to postgraduate instruction. It set out to interest the practising physician, to hold his attention and to involve him in active participation by presenting an actual patient problem without revealing the diagnosis. At the end of each segment, which demonstrates some aspects of the patient's condition, the viewer is asked to answer specific questions which involves him in observation, discrimination, deduction and decision making on the basis of the evidence presented to him. The succeeding segments may show him that he has made a mistake and why; he alone knows whether he has been right or not in his replies and learns from his mistakes. The whole material is subsequently discussed in relation to physiology and pathology with the aid of an associated text. A more detailed discussion by Dr. Judge on this method has been included in the proceedings.

Mr. R. MacLean of the Television Service of the University of Glasgow presented a very professional recording from his centre which illustrated how television can be used to great advantage to afford students visual and closely integrated aural experience of phenomena not normally accessible to him. The recording included some very clear views of the larynx in a patient with thyroid disease.

PART III CLOSED CIRCUIT TELEVISION

THE SINGLE CAMERA CCTV CHAIN

by

C.J. Duncan

Introduction

The single CCTV camera, linked by a cable to one or more display units, normally in the same room and used without an added sound channel should be regarded as a personal tool, as an extension of the lecturer's personality and lecturing apparatus. So viewed, it may not be acceptable as a tool to all. Those who want no part of it should not apologize for refusing to use it, they must be free, as with chalk and chalkboard, notes and slides, to choose quite freely which aids they desire to employ for the instructional task they have set themselves.

As such, single camera CCTV is a totally different medium from television used for the widespread diffusion of a set piece, whether this be a spoken lecture or a visual demonstration. Primarily this is because the personality of the lecturer is present in the flesh - what is seen on the display is a supplement to, or is supplemented by his real presence and actions, by his real commentary, by real interruptions or other interplay with the audience.

These circumstances impose different constraints both upon the apparatus used and upon the methodology of the presentation. It is wise to realize this explicitly at the outset. It changes the balance between the camera and the number of monitors, it affects the choice of lighting and the type of lens, and, in addition it is closely affected by the ability of the lecturer to say and think one thing with one part of his brain while he is manipulating apparatus almost subconsciously with the other.

The appropriate conditions of use.

Firstly let us consider how best CCTV can be used in this simple way. The audience should not be too large. Although it is possible to reach a large audience with the televised picture and with reinforced sound, the 'connective tissue' of real gesture, attitude and verbal asides would be lost, unless we took some special precautions such as to provide those in the back rows with binoculars. We have used CCTV at Newcastle for enlargement of detail in anatomy lectures, for teaching metallography, in physiology lectures, for transfer of dial and moving chart information, for step by step manual instruction in operative dental surgery techniques in the 'phantom head' laboratory, and so on. A rather special case would occur in the use of CCTV in teaching histology where the black and white presentation of coloured stains imposes at present some limitations, but it is used in pathological teaching by Dr. Scott at the Royal Free Hospital and there are a number of other single-handed users in various universities.

The operational requirements

We can state quite briefly the broad limitations most postgraduate tutuors would, at least initially, wish to place upon the use of this equipment. They

would wish it to be completely under the control of the lecturer, and be simple to adjust and to use - even if this involves more technical complexity and additional work out of lecture time. At most they would wish to deal with one technician who remains normally outside the lecture area during its use. It would generally require no microphones or electronic intercommunication outside the lecture theatre, and above all, it should be stable, that is capable of operating without much adjustment, except by the lecturer at the camera position, for at least an hour.

More technical matters need to be settled for each specific end use. There must be a decision on the range of field sizes required - from the largest to the smallest. The selection and isolation of what is to be shown must be easy, positive and accurate, i.e., a good viewfinder is essential - according to circumstances it will need to be on the camera or on the bench directed towards the lecturer's view. In both cases the image should subtend at the lecturer's eye at roughly the same angle as do the display units in the room to their furthest viewers, and this with substantially the same definition and accuracy of shape (so-called 'geometry'). In this way, as the lecturer uses the camera, he is given an accurate indication of what his viewers can see and can be expected to appreciate.

He will need to have adequate sharpness and definition, which, when modern zoom lenses are used, is linked up operationally with the actual magnification used. He should have sufficient light available to enable a large 'depth of field' to be obtained, and to avoid smear when the vidicon camera is moved. The lighting must also be cool and safe in use, as well as easy to manipulate and concentrate. The camera itself must be firmly held - but again easy to move positively in any desired direction within specified limits and easy to return to a pre-rehearsed position. These requirements place quite severe limitations on the apparatus chosen.

In general this means that the smaller and cheaper cameras on light-weight stands will not be acceptable except for very restricted applications. Although weight is not always synonymous with stability, it frequently is, both electronically and mechanically speaking.

However, there is one prime consideration affecting the choice of camera gear, although less so the choice of monitor, and that is the method of distribution. Since the transmission is to be over short lines, i.e., in the same room, a simple video coaxial cable is all that is required; elaborate modulators and demodulators for a Rediffusion type of distribution system are not needed. Unless, of course, this little island of CCTV is to be considered as part of a larger system. If you feel you will sooner or later want to add a second camera, record into a remote video tape recorder or disseminate your pictures elsewhere than close to their origination, then you will have to use a more elaborate system employing generally an external synchronizing pulse generator and a variety of electronic processing devices. The possibility of later additions will affect the choice of the initial equipment.

Equipment

May I recommend tutors always to keep their operational needs to the forefront. The first question should be "what do I want to show?", then "how can I show this?", and then only the question "how can I manipulate this apparatus or that, to produce the effect I desire?". The figures which I published some four years ago (1) for various types of equipment are in the main still true. Such developments

and improvements as have taken place have been provided by the manufacturers largely without significant increases in price. A non-expandable, simple camera, fitted with single lens and using a 'monitor', usually an adapted or simply recased TV set, will cost about £500. The type of gear which will be expandable at a later stage to accept input from another camera or from a video tape recorder and give something to spare both in serviceability, definition and stability will cost nearly £1000 with zoom lens and a rigid manipulatable stand and two or three semi-professional monitors or hotted up T.V. receiver chassis.

For a simple, invariable task, especially where the lecturer can carefully adjust his image and magnification to make sure that everything he wishes to show is drawn sufficiently large on the screen and where he does not want to indulge in any elaboration, the Group I apparatus may well be good enough - at least for three to four years. Those who know they will rather sooner than later join up with a larger complex may decide at the outset to buy the more comprehensive equipment.

Practically all manufacturers can provide equipment in Groups I and II. The things to look for are, therefore, before and after sales service, which will include either a maintenance contract, an on call replacement agreement or an offer to train your own technician properly in preventive maitenance. These should probably be as important criteria as simple technical performance, which should be checked on site, necessitating the acquisition of some reliable test charts and, at least, the loan of a suitable cathode ray tube measuring equipment. The BBC hold courses for technicians and 'floor managers', and there are a number of other places, such as the Portsmouth College of Technology, where instruction is provided (details are given in University Television Newsletter No. 4. available from the Research Unit National Extension College, 8 Shaftesbury Road, Cambridge).

You may decide, it is better to hire equipment at least for a period of assessment. One of the TV relay companies may here be of considerable help. Although they may have the greatest expertise in multiple outlet systems, they have large local depots and staff. They are generally either manufacturer or distributor of medium quality, standard equipment for industrial use and should be investigated by hospital boards, both as a potential supplier and as a maintenance contractor.

All television signals require synchronising pulses, but the difficulty and diversity occurs in the way that they are provided. When a single camera is in use, there is little difficulty. Both Group I and Group II equipments are generally provided with built in "synch-pulse generators"; or a system of random scanning is used, however to the detriment of quality. Much closer control over the synchronisation of signals is required, if clear, steady displays are to be shown from multiple sources. The ease with which it is possible to switch from the display of one signal to that of another and maintain quality of image may well determine which camera gear is to be used. At the moment we are waiting for a design break-though in this provision and a much lower price for the independent synch-pulse generator; the signs are that the new Phillips school camera complex, although it is specifically slanted towards multiple classroom outlets, may provide it.

V

As far as the economics of specialised quality viewing in universities and postgraduate medical education is concerned, the big need is for better 19in., 23in., and 27in. monitors or display units. A lecture theatre may have as many as six and generally somewhat inaccessible units, it is of considerable importance that they should give a stable display, not "go on the blink" very often, or catch fire due to inadequate safety margins in transformers or careless internal wiring. To avoid this by buying professional quality monitors doubles or even trebles the price. Some technical improvements have been introduced (for instance by Rank Bush Murphy) into the standard domestic receiver for use in CCTV.

The market price is still generally over £100 and is as much or more for the small 8in. unit. Although there is some label swopping among manufacturers, it would seem that only massive orders for one size and specification will bring the price down, put the quality of construction up and encourage the engineers to produce foolproof displays. For only slight loss of picture quality, it is possible for an electronics technician to modify a mass produced and therefore cheaper domestic receiver (2), so that it can be switched to receive video signals from a television camera as well as off-air signals.

A number of people have produced quite versatile single-operator equipment which, in some instances, can replace the blackboard, slide projector, episcope and x-ray viewing box, as well as providing for display of specimens. A typical set-up allowing for at least five types of display was described by Close and Engel (3), and more recently Phillips have announced that they have a teacher's desk set-up in development which will have similar features. Both Gibson (Goldsmiths College) and Scott (Royal Free) have described 1-1 man studios, and Engel was concerned in developing one at Guy's Hospital several years ago (4). One aspect of manipulation is here paramount. The material is generally brought to the camera rather than the other way round. Adjustment of field size and focus are allowed but camera movement to the object field (except by mirrors) is generally avoided.

It is also a feature of the newer benches that they seek to integrate a video tape recorder with the live camera work. There are those who find the challenge of manipulation a positive spur to improve communication, but most will prefer the help of a video-tape recorder technician. Some material is suitable for preparation in advance, for repetition until adequate (if not perfect), so that it can be played back at the appropriate moment without strain. This can be done with simple apparatus, but eventually the tutor will feel the need for more professional help. The use of a video-tape recorder will relieve the new user of some of the strain. He can diagnose his own ability and achieve moderate performance in private and so gain the confidence that is required for competence, rather like learning to drive a motor car.

Some details need attention in any situation. Although the general illumination from an ordinary 100 watt, or better a 150 watt, reflector spot or flood will generally be adequate for small fields, it is worthwhile to have a slightly more concentrated source, such as a low voltage reflector spot, or a low voltage desk lamp with auto headlight type bulb for illumination of surface detail and depth in small objects. Easily adjusted back lighting for clinical subjects and an intermediate grey shade background will be useful. This lighting should preferably be controlled, and stands and wires should be kept clear of the floor. An illuminated opal viewer preferably horizontal, will be needed to show x-rays or transparent overlays, i.e. as with an overhead projector. Although I have

postulated that sound recording or reinforcement is unnecessary, that is not to say that an independent tape recorder - for heart sounds or for relevant interview material cannot be integrated with the CCTV, but it will not be technically a part of it.

Conclusion

Like all inanimate apparatus television gives back only as much as human endeavour and intelligence puts in.

That is why the correct approach is:-

(a) To decide on and specify the primary operational requirements, adding then, if you choose, some desirable secondary developments.

(b) To choose the appropriate method of presentation and the appropriate equipment to go with it. Here the best advice is to find within your hospital or group some engineer competent to advise you, but not to decide for you, and to develop a happy relationship with him.

(c) Select your suppliers on the basis of reputation and manifest service, both before sales and after, and question them quite severely as to what their spares and maintenance policy is to be.

(d) Decide to devote some of your precious time to practice in private or with a few interested colleagues.

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USING TWO CAMERAS

by

Roderick MacLean

One television camera can be invaluable as a visual aid; it is questionable whether it ever really amounts to more than that. By adding a second camera the teaching potential of your equipment is more than doubled. Much of our single-camera work is conducted on the assumption that the teacher is present with his students, that the camera merely assists with the presentation of detail in the context of a complete, live teaching situation to which the demonstrator's own expressions and gestures largely contribute. But once allow that the "visual aid" element has to be relayed or recorded, and there is a strong case for a second camera which can, at the very least, present demonstrator and context along with the material demonstrated.

The inclusion of context is never to be ignored in the teaching situation: we learn, or at least remember, almost as much from the context as from the detail which is properly the subject of study. Two cameras offer the opportunity of constantly relating the detail, the significant activity or symptom, with the whole situation of which it is a part.

Which is the detail and which the context may sometimes be a matter for argument; the significant thing, so long as we are speaking in general terms, is that a two-camera unit makes both available and - often without explicit spoken reference - points to the relationship between them. Take the interview situation, which, under many different names, is basic to a wide range of medical practice and teaching - the psychiatric interview, bedside teaching, clinical demonstration, even a minor operation under local anaesthetic. Here, for good teaching, we need vivid and instantaneous juxtaposition of action and reaction. Two cameras make this possible. Television has not necessarily done its job in the psychiatric interview (to take just one example), if the camera has been locked on a general shot of the patient. The significant and memorable detail may be a wistful gesture of the hand, or the consultant's own reaction to one of the patient's answers. With two cameras this kind of coverage can be achieved - not necessarily imaginative, certainly not sensationalised, but simply well directed in terms of good medical teaching.

At the more mechanical level - no less important - the second camera opens up a whole range of comparisons: the illuminating comparison of diagrammatic or schematic representation with the real thing; the comparison of outwardly observed symptom with the X-ray plate; the visual comparison of stages - stages of development or deterioration, with animated captions or a succession of superimposed stills. Add to all this the reinforcement of the spoken word, for instance where a new terminology is introduced, by superimposing or cutting away to the printed word while you speak. The establishment of comparisons, the underlining of relationships, the reinforcement of one image by another, these are the very stuff of good teaching. Always supposing that you are committed to the use of television at all - you will accomplish these more readily with two cameras.

At what cost in sheer complication - let alone money? First, the human complication: you will be more than well advised to make sure that you have a

television technician. Vital in any case, he becomes indispensable if you are also using video-tape (and you are almost certainly wasting your investment in television if you do not). Next, a second camera, of course, preferably with a viewfinder; a second camera mounting, which is always a separate item; probably a zoom lens - additional lenses, in any case.

And how do you "marry" your two cameras? You may decide to make one the master and the other its slave, which you might do for as little as £40: but you may be well advised, especially if you plan to use video-tape, to invest in a sync-pulse generator, and that can cost you anything from £150 to £400.

Do you want simply to cut from one picture to another, good enough for many purposes, or do you want to "mix" and superimpose? If the former, you may get very satisfactory results for £50 or so; if the latter, you may well spend £350 on this facility alone. The permutations are numerous; but generally speaking progress from single-camera work to a two-camera unit, even without a video-tape recorder, may cost between £1,100 and £2,500.

CLOSED-CIRCUIT TELEVISION IN RELATION TO THE MANUFACTURER AND SUPPLIER

by

W. E. Budge

Television equipment and installations are not inexpensive. Although a single camera and receiver can be used for limited applications, there will always be a critical quantity for "minimum viability" - sufficient instrumentation for a specific task. Too little equipment or apparatus of too low a standard of performance, reliability and versatility may come to be regarded as wasted capital expenditure, as it is incapable of satisfying its owner's expectations. However, the purchase of equipment which is too good, should be regarded as equally wasteful.

The manufacturer and supplier of television equipment should not be placed in the embarrassing position where he unwittingly offers unsuitable instruments through ignorance of the potential customer's requirements. It is, therefore, essential that the medical school, hospital or postgraduate centre should first specify the situations in which television is intended to be used. Microscopy and radiography presuppose high resolution, which may be quite superfluous for the relaying of psychiatric patient interviews. Similarly, a single camera chain is all that would be needed for magnifying post-mortem findings, while the transportation of images from separate locations and their juxtaposition in the lecture theatre will require synchronization and compatibility of a different order of complexity.

Figure 1 represents a simple questionnaire to elicit some of the more basic answers from the potential user. In addition, it would invariably be helpful to prepare a detailed description of the proposed applications of television. This can then be used as the basis for a realistic technical and financial estimate.

Not infrequently, manufacturers and suppliers are asked to mount an actual demonstration of closed circuit television. This is always an expensive exercise, seldom satisfactory (due to inadequate specification of requirements) and hardly ever really justified. There are now sufficient television installations in all parts of the country for the intending user to inspect, both in the laboratory and under practical working conditions.

Once needs have been spelled out in terms of applications, manufacturers and suppliers can offer a great deal of information, advice and practical help. They will prepare detailed technical specifications and estimates to suit specific circumstances, based on very considerable practical experience, which includes the provision of microphones and other necessary sound equipment. Actual installation, wiring and testing, as well as continuing maintenance can form an integral part of contracts undertaken by reputable companies.

In almost all instances training facilities for electronic technicians are also available. This is an important consideration; however simple or complex a closed circuit television system may be, its usefulness is directly dependent on the competence with which it is handled.

Figure 1

CLOSED CIRCUIT TELEVISION APPLICATION

QUESTIONNAIRE

Accurate analysis of your requirement for Closed Circuit Television will be facilitated by filling in this form as completely as possible.

CUSTOMER:

1. OBJECTIVES

   Description:

2. SIZE OF OBJECTS: Height _____ Width _____ Depth _____

   Comments:

3. DESCRIBE COLOUR AND TEXTURE OF:

   (a) Object:

   (b) Background:

4. LIGHTING OF TELEVISED OBJECTS: (if known)

   Incident Light _____ foot candles Reflected Light _____ foot candles

   or state type of Light Source _____ and wattage _____ W

   and distance of source to object _____ ft/metres

   Comments:

5. DISTANCE FROM CAMERA TO TELEVISED OBJECT:

   Maximum _____ Depth of field required:

   Minimum _____ _____

6. MOVEMENT OF CAMERA:

   Is it desired to change location of camera? _____

   Is it desired to pan and tilt the camera?

   _____ Manual? _____ Remote? _____

6. MOVEMENT OF CAMERA: (Continued)

Is the object moving during observation? _____

State rate and direction of motion _____

Is remote control of the following required? Focus _____ Iris _____

Zoom _____ Turret _____

7. DISTANCE FROM CAMERA TO MONITOR:

_____

Number of	
Cameras	Monitors

8. LOCATION OF:

	Camera	Monitor	Control Equipment
Indoor			
Outdoor			
Hazardous			

Comments:

9. AMBIENT TEMPERATURE RANGE:

	Camera ^{o}C or ^{o}F	Monitor ^{o}C or ^{o}F
Maximum		
Minimum		

Comments:

10. MAXIMUM RELATIVE HUMIDITY:

	Camera	Monitor

Comments:

11. DESCRIPTION OF ATMOSPHERE:

Type	AT THE VICINITY OF Camera	Monitor
Dusty:		
Foggy:		
Corrosive:		
Combustible:		
Explosive:		
Altitude:		
Fungus:		
Magnetic Field:		
Atomic Radiation:		
Comments:		

12. VIBRATION OF MOUNTING:

	Camera	Monitor
Frequency:		
Amplitude:		
Comments:		

13. ACOUSTICAL NOISE AMPLITUDE:

	Camera	Monitor
at Equipment:		
at Source of Noise:		
Comments:		

14. ELECTRICAL INTERFERENCE:

	Camera	Monitor
Power Line:		
Radiated Signal:		
Comments:		

15. POWER AVAILABLE:

AT THE VICINITY OF

Camera Monitor

A. C. or D. C.:

Frequency:

Voltage:

Stability: (A) Voltage:
(B) Frequency:

Comments:

16. INSTALLATION:

By Customer: _____ By Manufacturer: _____

Comments:

17. MAINTENANCE:

By Customer: _____ By Manufacturer: _____

Comments:

18. CAMERA USE:

_____ Hours per Day

_____ Hours per Week

19. INSTALLATION SITE AND GENERAL DETAILS

ANY SPECIAL FEATURES: (A plan or sketch is required.
Dimensions are Essential)

signed _____

date _____

S E Q U I T U R

DEPARTMENT OF AUDIO VISUAL COMMUNICATION

BRITISH MEDICAL ASSOCIATION

The Department has been established to promote the application of technology in medical education at all levels. Its Electronics Section can assist with information and advice on equipment, methods of operation and methods of presentation. A limited range of apparatus is available for demonstration of principles and to illustrate potential applications.

The Information Section has an extensive reference library of the literature and publishes a bi-monthly Information Bulletin, as well as relevant Data Sheets and occasional "guide" booklets.

The Teaching and Learning Library is being organized to advise on the availability of suitable material.

The Film Library publishes a catalogue of films available on hire from the Association and can advise on films obtainable from other sources. The conversion of video-tape recordings into films is being investigated and may come to be offered as a central service.

All enquiries should be addressed to the Director, Department of Audio Visual Communication, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

TELEVISION SECTION

ASSOCIATION FOR THE STUDY OF MEDICAL EDUCATION

The Television Committee of the Association for the Study of Medical Education was originally concerned with giving medical advice for the B. B. C. series 'Medicine Today' and with examining the responses of doctors who viewed these programmes or the similar series 'Postgraduate Medicine' transmitted by Independent Television. This work continues, but under the Television Section of ASME, who have assumed the work of the Committee, the interests have widened. The following aims of the Section have been agreed.

1. To collect, distribute and exchange information on open and closed circuit television in undergraduate and postgraduate education.

2. To provide a source of informed advice on content and presentation of broadcasts for postgraduate medical education.

3. To undertake and promote research into all forms of television provided for medical audiences.

4. To organise appropriate conferences.

5. To collaborate with any body or bodies concerned with medical education by television and to assist in the establishment and maintenance of a library or libraries of video-tape and film suitable for television presentation.

At the Conference, it was felt that the development of television in Postgraduate and Continuing Education, was the aspect of television education on which the Section should first concentrate its activities.

A programme of research has therefore been drawn up which will:

1. Establish the present extent of television usage in Postgraduate Centres.

2. Continue to examine and evaluate television programmes in Medicine.

3. Attempt to identify the specific educational needs best served by television.

4. Relate programme structure to educational gain.

5. Attempt to identify the needs of General Practice best served by television.

The Television Section welcomes the experiences of teachers in the use of television, and would like to have their assistance in undertaking the above research programme. The activities of the Section are not confined to members of the Association, and we hope that all interested persons will maintain contact and thus enable the best experiences to be used over a wide field.

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